State Of Maryland Multi-Service Center Study

PHASE 600 Progress Report

Cost Estimates and Effectiveness

MARYLAND DEPARTMENT OF STATE PLANNING

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STATE OF MARYLAND MULTI-SERVICE CENTER STUDY

PHASE 600
PROGRESS REPORT

ANALYSIS OF COSTS & BENEFITS

FEBRUARY, 1974

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The work reported herein was performed pursuant to a contract with the Maryland Department of State Planning by GRUEN ASSOCIATES, INC. and their subcontractor, URBAN PATHFINDERS, INC.

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FOREWORD

At the direction of Governor Marvin Mandel and the legislative authorization of the General Assembly - Chapter 179 of the Acts of 1972, General Construction Loan of 1972, Item 32 - a budget authorization of $250,000 was approved for "Preparation of a program and plan, including a feasibility study for state multi-purpose centers to provide for convenient and efficient service delivery."

These actions were in response to a Department of State Planning Study which outlined the problems inherent in the present system for delivery of services from dispersed locations of State Agencies and the concern of the Governor and Maryland General Assembly over rising space costs and increasing citizen needs and requirements.

The Maryland Department of State Planning is conducting this study to determine both the feasibility and desirability of establishing a network of State MULTI-SERVICE CENTERS throughout Maryland providing one-stop service delivery directly, conveniently, economically, and personally to residents of the state.

If the concept proves to be feasible, the study will also provide plans for locating and developing such centers and/or for complementary alternative methods of providing such services throughout Maryland.

The State of Maryland is one of the most rapidly urbanizing states in the nation. This growth has brought into focus the requirements for delivery systems capable of responding to current and anticipated service needs within the fiscal resources of the state.

Experimental service centers on a lesser scale have been developed in various cities in the United States. However, there is not yet general agreement as to the form such service centers should take - either in their human resource and response organization, their spatial organization, their locational criteria, or their management and fiscal economy programs. This study will delve deeply into all of these aspects.

Simultaneously, the Department of State Planning is underway on two other major study endeavors which have an extremely close relationship to this study...the Generalized State Land Use Plan and the Human Resources Plan.

Ideally, and perhaps without precedent, the Study Team and the State Planning Coordinating Committee will provide a parallel participation in all three studies. This process will optimize the guiding of inquiry, the provision and conversion of information, and the formulation of premises and will assure that the resultant findings and recommendations are sensitive and responsive to varying state and local systems and requirements.

This MULTI-SERVICE CENTER STUDY is being produced by the consultant firm of Gruen Associates, Inc. It is to be a fifteen month task and is divided into twelve distinct study phases. The specific purpose of each of the twelve study phases is described in the Phase 100 - Progress Report.

Phase 600, Costs and Benefits, was prepared by URBAN PATHFINDERS, INC. under a subcontract with Gruen Associates, Inc. and is presented in this report.

SUMMARY

SUMMARY

The first five phases of the Multi-Service Center Study have:

- Organized the study program (Phase 100)
- Collected data on the existing state service delivery system (Phase 200)
- Analyzed and forecasted future services requirements (Phase 300)
- Formulated alternative service delivery concepts and selected two concepts for further analysis (Phase 400)
- Evaluated the concepts as to accessibility, compatibility, efficiency, convenience, and flexibility (Phase 500).

Phase 500 of the study defined and selected for further analysis two service delivery systems for the State of Maryland: (1) Concept A (the existing system), characterized by scattered office facilities within service areas delineated by political boundaries (generally county boundaries), and (2) Concept F, a conceptual Multi-Service Center system characterized by centralized office facilities within service areas delineated by population support levels.

The purpose of Phase 600 is to estimate, analyze, and compare the gross system costs and benefits associated with the two alternative delivery systems selected for further analysis by earlier study phases.

This report concludes that the MSC concept of service delivery can provide significant benefits to the users of state services at a substantial savings in costs to the State of Maryland.

By the year 2000, compared to the existing system, the MSC concept could reduce state costs by 33%; user costs by 36%. Total system savings (to both user and state) could reach $209 million annually by the year 2000.

The study finds that personnel costs make up the bulk of current state costs (95%), while transportation costs are the predominant factor in current user costs (40%).

In exploring the cost/benefit relationships in selected MSC concept design elements, it was found that rural users may still spend more for services than urban users. In extending services to rural users, the level one center was found to be more cost effective than the mobile contact unit. The method of delineating service areas under the MSC concept was determined to be economically valid.

PHASE 600
PROGRESS REPORT

INTRODUCTION

This report is an analysis of the systems developed and described in the Phase 400 and Phase 500 reports prior to an evaluation of the agency and citizen committee comments on those two reports. The iterative nature of the MSC study permits, and in fact requires, the continued revision and redesign of the service delivery concepts in response to these comments and to problems and shortcomings discovered in the study process itself. Phase 800, MSC System Selection, will reflect revisions to the alternative system concepts through this "fine tuning" process and incorporate the changes recommended by the financial analysis of this report and agency and citizen committee comments on Phases 400 and 500.

FORMAT

This report is presented in two parts, an included appendix, and a separate Appendix 600A. Part I, STUDY FINDINGS, discusses the study methodology, presents the analytical model, and arrays the summary cost values. Part I draws conclusions from the cost values and examines elements of the Multi-Service Center system in detail in order to suggest areas for design improvement.

Part II, STUDY PROCEDURES, discusses the cost models, model variables, and assumptions and presents the cost values in a

greater degree of detail. Relationships among the variables are examined. Values or ranges of values of the variables are presented.

In the Appendix included in this volume, the level of degree increases. Models are presented in equation form and variables are arrayed in tabular format.

In the separate document, Appendix 600 A, model calculations are shown and more elaborate development of variable values is included.

PART I
STUDY FINDINGS

APPROACH

METHODOLOGY

The economic analysis undertaken in this phase of the study looks at the two major cost elements of the state service delivery system: state costs and user costs. State costs are those costs incurred by the state government in delivering services and includes such items as employee salaries and office rent. User costs are those costs borne by state residents in availing themselves of the services offered by the state, and include such items as transit fares and time spent receiving service at a state office. The total costs of any delivery system is the sum of state costs and user costs.

Benefits to the state government or to the user appear as cost savings. In addition, there are intangible benefits which accrue to county and local governments through adoption of particular service delivery systems but are not quantified by this analysis.

A seven step methodology was utilized to conduct this analysis. Figure 1, on the following page, presents this methodology in graphic terms.

Steps 1 through 3 (Alternative Concept, Define Assumptions, Format Alternatives) were accomplished in Phase 500 in which two alternative service delivery systems were defined and selected for further study.

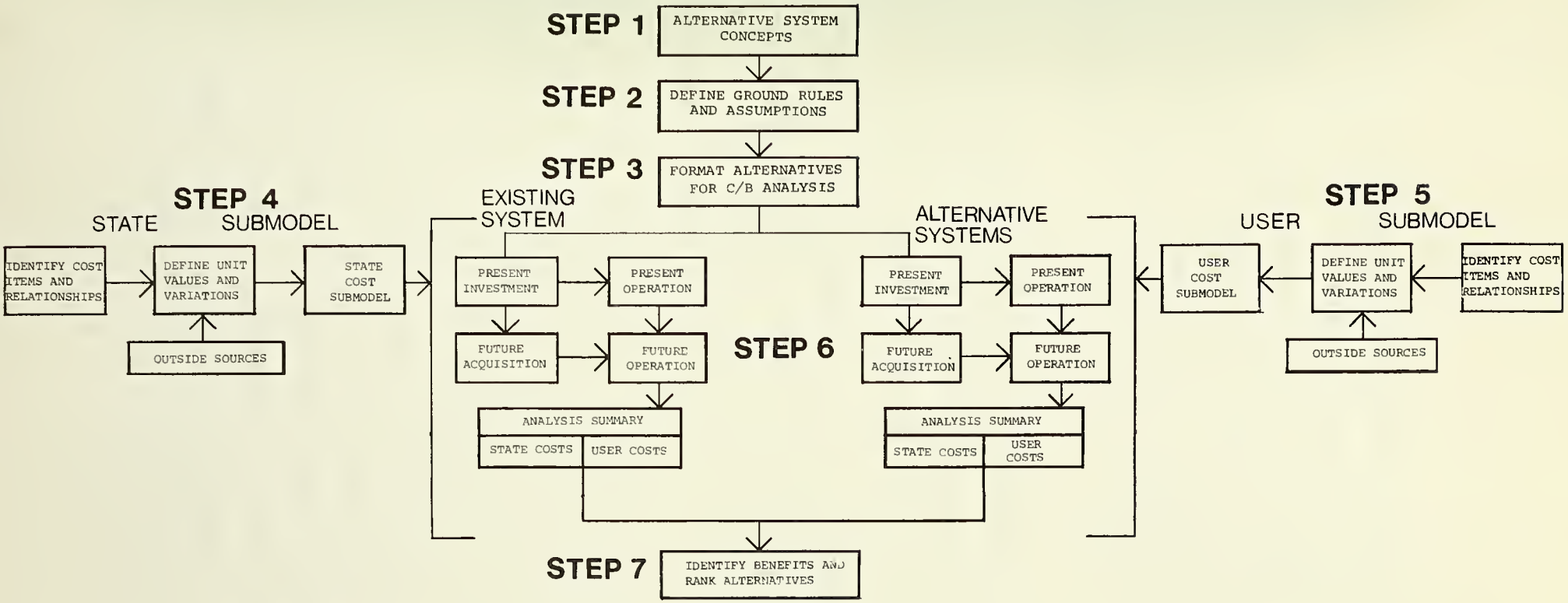


FIGURE 1

SERVICE DELIVERY SYSTEM ANALYSIS

MSC PHASE 600 - METHODOLOGY

Steps 4 and 5, development of state and user cost models, are similar. They involve first identifying the major cost components (variables) in the state's costs and the users' costs, identifying their theoretical interrelationships, and defining the desired level of detail. Researching and identifying the actual numerical values to be substituted into the model were next accomplished.

Step 6 is the process of synthesizing the state and user cost models and operating the models by substitution of numerical values to produce the estimates of total system costs.

Step 7 interprets the system values developed in Step 6, identifies the economic benefits of each delivery system concept in terms of cost savings, and ranks the concepts in order of most beneficial total system cost.

Figure 2 shows schematically the BASIC COST MODEL which is the key analytical tool used in Step 6 to evaluate the total costs of the alternative systems. The basic cost model combines the models of Steps 4 and 5 and illustrates the relationships among the cost elements. Both the state model and the user model is composed of a series of submodels which are in turn composed of more detailed equations. While the equations and individual variables are discussed in more detail in Part II and the appendix, the following paragraphs will serve to summarize the major cost elements of the basic cost model.

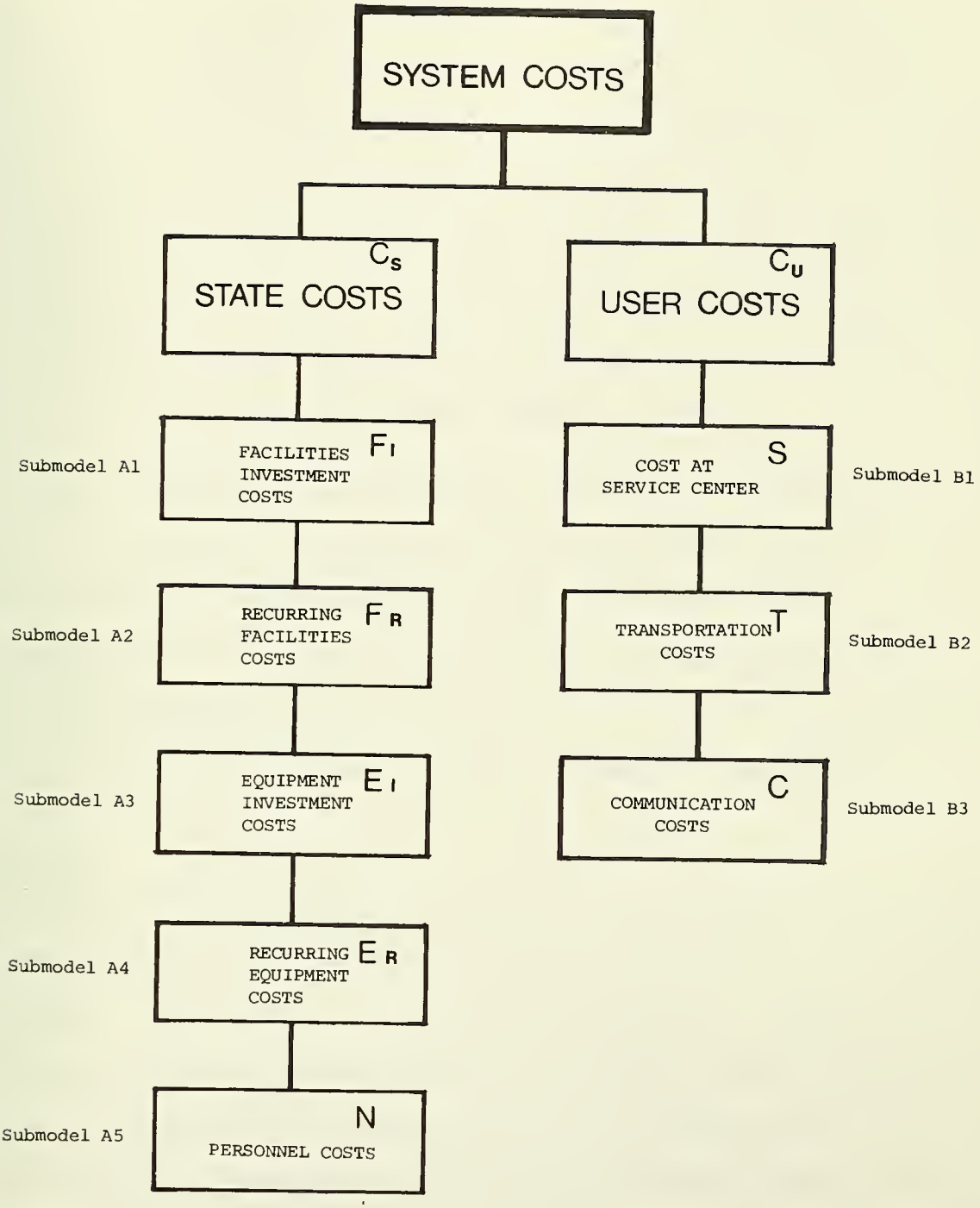


FIGURE 1.2
SERVICE DELIVERY SYSTEM
BASIC COST MODEL

State costs are the sum of costs involved in the acquisition of real estate (FACILITIES INVESTMENT COSTS), plus the costs involved in leasing and operating real estate (RECURRING FACILITIES COSTS), plus the costs involved in acquiring equipment as data processing and automotive equipment (EQUIPMENT INVESTMENT COSTS), plus the costs involved in operating and maintaining that equipment (RECURRING EQUIPMENT COSTS), plus the costs of personnel and personnel related overhead (PERSONNEL COSTS).

User costs are the sum of the user's costs at the service center, principally the value of his time spent receiving service (COST AT SERVICE CENTER), plus the user's costs in getting to the service center from his home or place of work (TRANSPORTATION COSTS), plus the user's costs in communicating with the state by telephone or mail (COMMUNICATION COSTS).

ANALYSIS

Phase 500 of the Multi-Service Center study defined and selected for further study two service delivery systems for the State of Maryland: (1) Concept A (the existing system), characterized by scattered office facilities within service areas delineated by political boundaries (generally county boundaries), and (2) Concept F, a conceptual Multi-Service Center system, characterized by centralized office facilities within service areas delineated by population support levels.

Concept A consists largely of leased office space, a small portion of which is gratis. In projecting Concept A to the year 2000, it was assumed that total office space and personnel requirements would grow in direct proportion to population, that the existing percentages of leased to owned office space will continue to govern, and that office space will continue to be concentrated at county seats.

Concept F describes a system of strategically located Multi-Service Centers which offer centralized client intake and outreach facilities and administrative functions, consequently reducing space and personnel requirements. Growth of Concept F through time is accomplished by adding new centers in response to population growth.

This analysis evaluates the costs and benefits of both systems at two points in time, 1970 and 2000, and arrays the results. It compares the two systems extensively in the year 2000 time frame. (Some comparison of the systems in 1970 is also made, but since the Concept F system did not exist in 1970, that comparison is a hypothetical judgement of the past, and the most meaningful comparisons were felt to lie with the year 2000 values). 1970 was chosen as the base year for analysis since this is the most recent year for which complete data could be obtained. Additionally, specific design elements in the proposed MSC system (Concept F) were examined for cost/benefit

relationships and economic implications that might lead to refinements in the system to be undertaken in subsequent phases of this study.

Several very broad assumptions have been made about the systems and about the models:

(1) Concept A (the existing system) has been approximated by the assumption that all services are available at each county seat. Although in no Maryland County are all services available at the county seat, this assumption is justified by the clustering of existing services near county seats and the fact that future development of state facilities under Concept A would be concentrated at county seats. Use of this assumption in the model calculations results in a conservative estimate of user cost savings since it understates the distance a user must travel to get services under Concept A.

(2) The model assumes that both systems offer the same services (e.g. employment placement, occupational training, veterans' relief) at an adequate level of service (all persons receive state service who need it). Phase 500 includes a detailed listing of these services.

(3) Users of state services comprise all citizens of the State of Maryland.

(4) All costs for the user and state submodels are expressed in dollars per year so that all values are compatible and may be summed.

CONCEPT SYSTEM COSTS

The total (state-user) annual costs of Concepts A and F in 1970 and 2000 are as follows:

CONCEPT	1970	2000
A	$ 244,250,000	$ 626,256,000
F	190,261,000	417,351,000

At both points in time, Concept F (the Multi-Service Center system) is less costly than Concept A (the existing system). Had Concept F been operational in 1970, the combined state and user costs would have been 22% less than those experienced under the existing system.

In the year 2000 the potential savings under Concept F increase; by then its costs would be about 33% less than those under the existing system (2000).

Projected savings of Concept F over the existing system would have amounted to $54 million annually in 1970 and $209 million annually in 2000.

MAJOR COST FACTORS

State Costs

Table 1 arrays total state and user costs for both concepts.

Savings in state costs account for the major cost advantage of Concept F over Concept A. Implementation of Concept F rather than

TABLE 1

CONCEPT SYSTEMS COSTS SUMMARY*
($ per year)

CONCEPT A	1970	2000
Total Cost	$ 244,250,000	$ 626,256,000
State Costs	206,426,000	530,373,000
User Costs	37,824,000	95,883,000

CONCEPT F	1970	2000
Total Cost	$ 190,261,000	$ 417,351,000
State Costs	158,569,000	356,323,000
User Costs	31,692,000	61,028,000

*Values shown are based on 1970 and year 2000 (inflated) dollars. For a comparison in 1970 constant dollars, see appendix.

continuation of the existing system would save the State of Maryland over $174 million annually by 2000, a 33% savings over costs anticipated under Concept A. This represents 83% of the total savings expected under Concept F (2000).

Reduced numbers of state employees are responsible for the major savings in state costs. $168 million will be saved under Concept F (2000) by employing fewer service-delivery-related employees than projected for Concept A (2000). This represents 80% of the total year 2000 savings expected under Concept F. Employee costs account for over 94% of total state costs in both concepts.

About $3 million in annual savings (about 1% of total system savings) is evident in facilities costs under Concept F (2000). These savings result from reduced office space requirements under Concept F (only 71% of Concept A requirements).

Savings in total equipment costs are also about 1% of total system savings under Concept F (2000).

User Costs

Under Concept F (2000), users of state services will spend almost $35 million less each year than under Concept A (2000), a 36% user savings over costs anticipated under Concept A. This represents 17% of the total system savings expected under Concept F (2000).

Reduced transportation costs (due to more accessible service centers and a reduction in the total number of trips to service centers) , result in the greatest user savings ($22 million per year) and account for 11% of total system savings. Transportation costs account for about 40% of Concept F (2000) user costs.

Savings in user communication costs were about $12 million annually, accounting for 6% of total system savings.

Savings in time spent at service centers accounts for over $1 million in annual user savings, less than 1% of total system savings.

CONCLUSIONS AND RANKING

Concept F presents significant economies over Concept A which benefit both the State of Maryland and the user of state services. The savings lie primarily in state personnel costs and in user transportation costs.

In terms of most economic benefit and least cost, the two Concepts are ranked as follows:

1. Concept F
2. Concept A

MSC DESIGN IMPLICATIONS

The preceding sections have compared Concepts A and F and have identified the economic benefits of the Multi-Service Center system concept.

In order to further refine the Multi-Service Center system concept, this section examines more closely the design elements of Concept F. Major findings are:

- Facility cost savings are the result of a reduction in total office space requirements, and not scale economies in construction costs.
- The satellite center concept is a more cost effective means of expanding state-user contact than the mobile unit.
- Rural users will incur greater costs in availing themselves of service than suburban or urban users.
- The service area designation strategy of Concept F is economically valid.

The following paragraphs discuss these findings and their supporting assumptions in more detail.

FACILITY SIZE-COST RELATIONSHIP

The analysis indicates that the construction of larger facilities should not be expected to result in building construction or operational costs savings. On the contrary, Figure 1.3 shows that,

MSC LEVEL	SIZE/ SF	$/SF, 1970
2	30,000	55.93
3	60,000	57.52
4	150,000	62.50

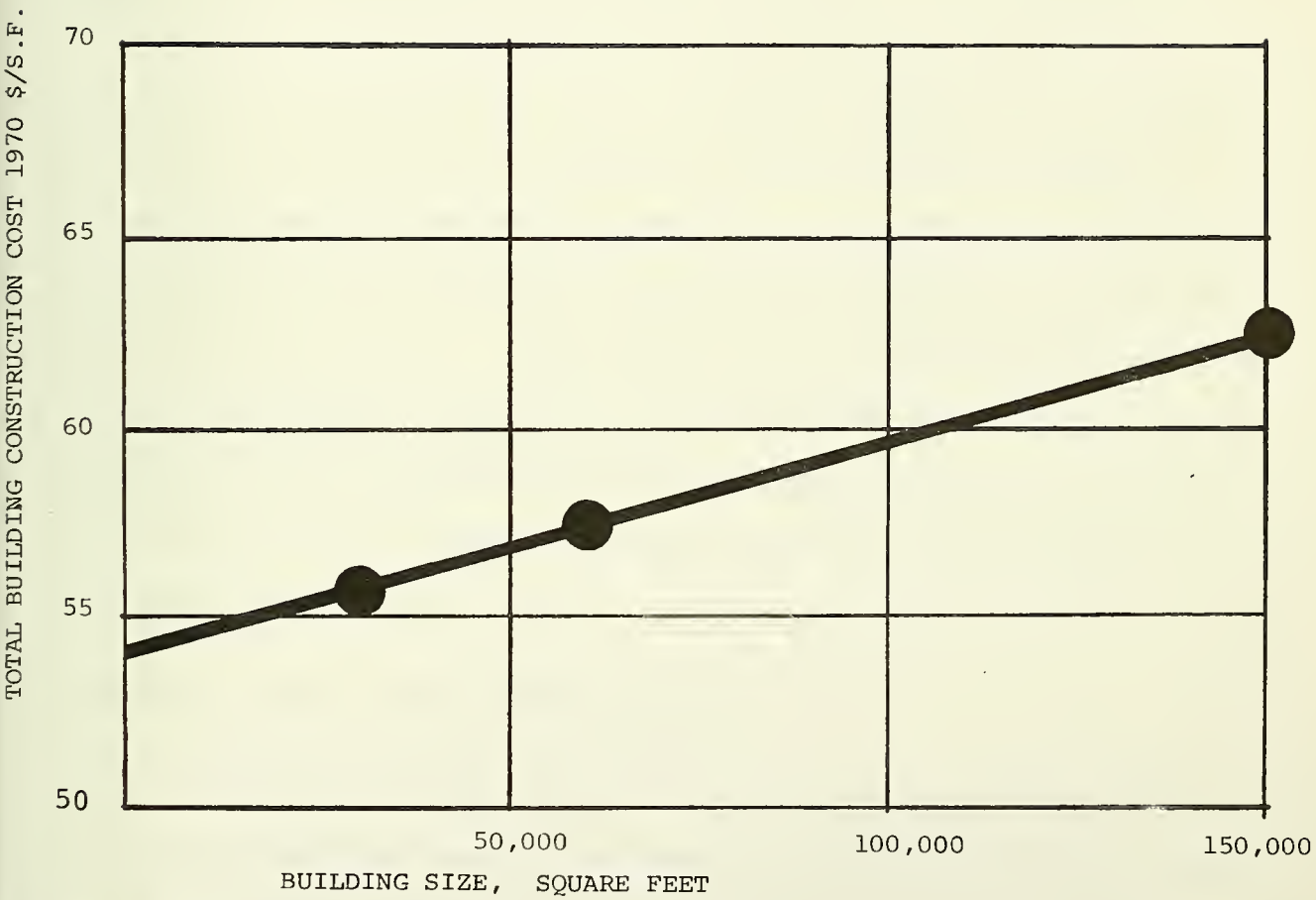


FIGURE 3

BUILDING SIZE VS. COST

within the range of MSC sizes anticipated, total building construction costs per square foot (including land and parking facilities) increase approximately linearly with building size. The basic assumptions behind this relationship are that the larger buildings will be located in more urban environments where land costs are higher and increasingly expensive structures are necessary to take advantage of necessarily smaller lots (high rise offices and multi-level parking vs. single level structures with surface parking, for example).

The savings in facilities costs (Concept F (2000) over Concept A (2000) reflected by the analysis are the result, therefore, not of more economical structures, but of a reduction in the total building square footage required by Concept F (1,692,000 SF vs. 2,382,577 SF). (See appendix for tabulation of Concept F space requirements). Less space is required because of the reduced personnel requirements and increased ability of agencies to share space for common functions previously duplicated at scattered locations.

EXPANDED CONTACT COST EFFECTIVENESS:

To gain insight into the effectiveness of two proposed modes of service delivery, level one centers and mobile contact units, the Lower Eastern Shore service area under Concept F (200) was examined.

It was found, for this particular service area (Somerset, Wicomico, and Worcester Counties) under the given assumptions, that establishment of level one centers (at Snow Hill and Princess Anne) and mobile contact units in addition to the one level two MSC (at Salisbury) would result in a state expenditure of approximately $2.32 for every $1 in benefits realized by the users because of savings in travel costs. Establishment of level one centers only, in addition to the MSC, would result in state costs of $1.81 for every $1 of user benefit.

Development of mobile contact units only, in addition to the MSC, would result in state costs of $4.90 for every $1 of user benefit.

These values imply that, on purely economic grounds, establishment of expanded contact facilities is not justified. The failure to provide services at local level however, would mean that services might not be available at all to many people (the handicapped and the impoverished, for example) regardless of the cost/benefit relationship. The need for expanded contact facilities is evident, and their establishment is justified on social rather than economic grounds.

Level one centers should be provided at county seats, therefore, in preference to deploying mobile units which are not as cost effective a means for expanding state contact under present technology. The economics of the mobile unit should be re-examined in the future, when technology may improve the cost/benefit relationships of this service mode.

RURAL VS. URBAN AND SUBURBAN COSTS

Concept F (2000) was tested in three specific service areas to determine the cost relationships among typical rural, urban, and suburban areas. The specific areas examined were: the Lower Eastern Shore service area (Somerset, Worcester, and Wicomico Counties), the three service areas comprising Howard County, and one Baltimore City service area.

Operating the state cost model with input data from the specific service areas resulted in the following state costs:

urban:	(Baltimore City)	$46/person
suburban:	(Howard County)	$45/person
rural:	(Lower Eastern Shore)	$41/person

These figures revealed that no dramatic differences in state expenditures existed among the tested service areas (the maximum difference is about 10%). More significant variations were found when the user cost model was operated with specific service area input data. User costs were:

urban (Baltimore City)	$ 7/person
suburban (Howard County)	$ 9/person
rural (Lower Eastern Shore)	$12/person

Transportation cost is the major factor causing the differences, because users must travel greater distances to the nearest MSC in rural areas than in urban areas. In spite of having a population one third smaller, the Lower Eastern Shore service area incurs aggregate annual user transportation costs almost 20% higher than those of the Howard County areas. (It should be noted, however,

that costs in all cases are lower under Concept F (2000) than under Concept A (2000).

A need factor appears in the user costs model. It accounts for the existence of greater numbers of social service clients (users) in economically depressed communities and correspondingly fewer users in high income communities. When need factors are included in the computation of user costs, the rural users costs are seen to increase even more disproportionately:

urban (Baltimore City	$ 8/person
suburban (Howard County)	$ 8/person
rural (Lower Eastern Shore)	$18/person

Here, the combination of higher per-person needs plus the greater user-to-service-center transportation distances characteristic of Maryland's more rural service areas is evident. High per-person needs of urban residents are compensated for by very short travel distances, while the more affluent suburban residents have the lowest per-person needs and only moderate travel distances.

This analysis would suggest the establishment of more service centers or expanded contact facilities in rural areas, if a goal of equal user costs state-wide is desirable.

SERVICE AREA CONSOLIDATION

Howard County was used to test the hypothesis that net economies might be effected if several small Concept F (2000) service

areas were amalgamated into one larger service area with one large service center.

As expected, user costs increased (+14%) when the three level 2 MSC's of Concept F (2000) were replaced by a single MSC of 90,000 SF (between level 2 and level 3), because user travel distance increased.

No savings in state costs were found in the consolidation, however, to offset the increased user costs. (State costs actually increased by 3%) this is explained by the fact that the MSC concept has by definition already taken in account the savings in personnel and equipment costs due to centralization. No further reduction in personnel numbers or costs by facility consolidation is therefore possible under the Concept F definition.

No construction cost savings result from the construction of one large building instead of three small ones for the reasons discussed earlier in this section.

This analysis tends to confirm the service area designation strategy of Concept F (2000), given the assumptions that led to the establishement of the threshold level MSC. Noted in an earlier section are the user cost differentials between rural and urban/suburban areas, but to equalize these differentials by subdividing service areas would require redefining the threshold MSC.

PART II
STUDY PROCEDURES

GENERAL

The total systems costs presented in Part I were developed from the two state and user cost models shown in Figure 4 and 5.

State and user costs develop from a number of submodels.

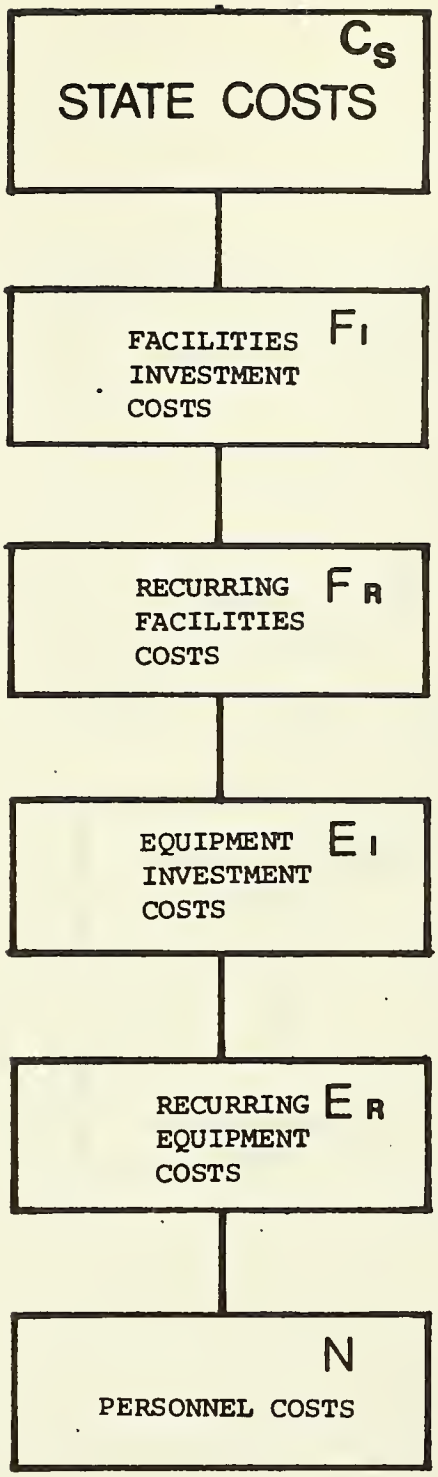
This portion of the Phase 600 report presents the five state cost submodels and the three user cost submodels, model variables and assumptions.

The appendix portion of this report tabulates in abbreviated form the values used in operating the submodels. Further detail about the submodels, including methods of estimating values for some variables and model calculations, is contained in a separate document, Appendix 600A.

Year 2000 values for unit cost variables were projected from the 1970 base year data according to historical inflation trends. Wage rates, for example, were projected by U.S. Bureau of Labor Statistics; travel costs by the transportation component of the Consumer Price Index; and square foot value of public buildings by U.S. Department of Commerce data. To the extent that data was available, projections were based upon linear regression estimates from 1935 to the present. The slope of the regression line was "stepped-up" (see figure 6) to pass through the 1970 data value as a point of departure for the projection. This

method takes into account the sharp increases in inflation that have occurred in recent years, but recognizes them as a short term effect and not a trend. In general, unit costs are estimated to be 60 to 80 percent higher in the year 2000 than in 1970. Appendix 600 A contains all historical cost indices used and the resultant year 2000 projections.

This section of the report summarizes the results of the submodel calculations using the inflated unit cost variables (current dollars) for the year 2000. The same values were used consistently in both Concept A and Concept F calculations, so that any error in choosing the actual unit cost variable affects both systems equally when comparisons are made. The appendix portion of this report contains a summary tabulation of submodel results in constant (1970) dollars.



FACTORS

Submodel A1 — LAND, BLDG. SIZE, FINANCE, GEOGRAPHIC INDEX, UNIT COSTS, TERMINAL VALUE, FACILITY LIFE

Submodel A2 — BLDG. SIZE, UNIT COSTS, GEOGRAPHIC INDEX

Submodel A3 — EMPLOYEES, UNIT COSTS, TELE-COMMUNICATION, EDP, AUTO, SPECIAL UNIT, FINANCE, EQPT. LIFE

Submodel A4 — EMPLOYEES, UNIT COSTS

Submodel A5 — EMPLOYEES, WAGE, FRINGE FACTOR, SUPPLIES UNIT COSTS, SUPPORT/ OPS RATIO

IGURE 4

STATE COST MODEL

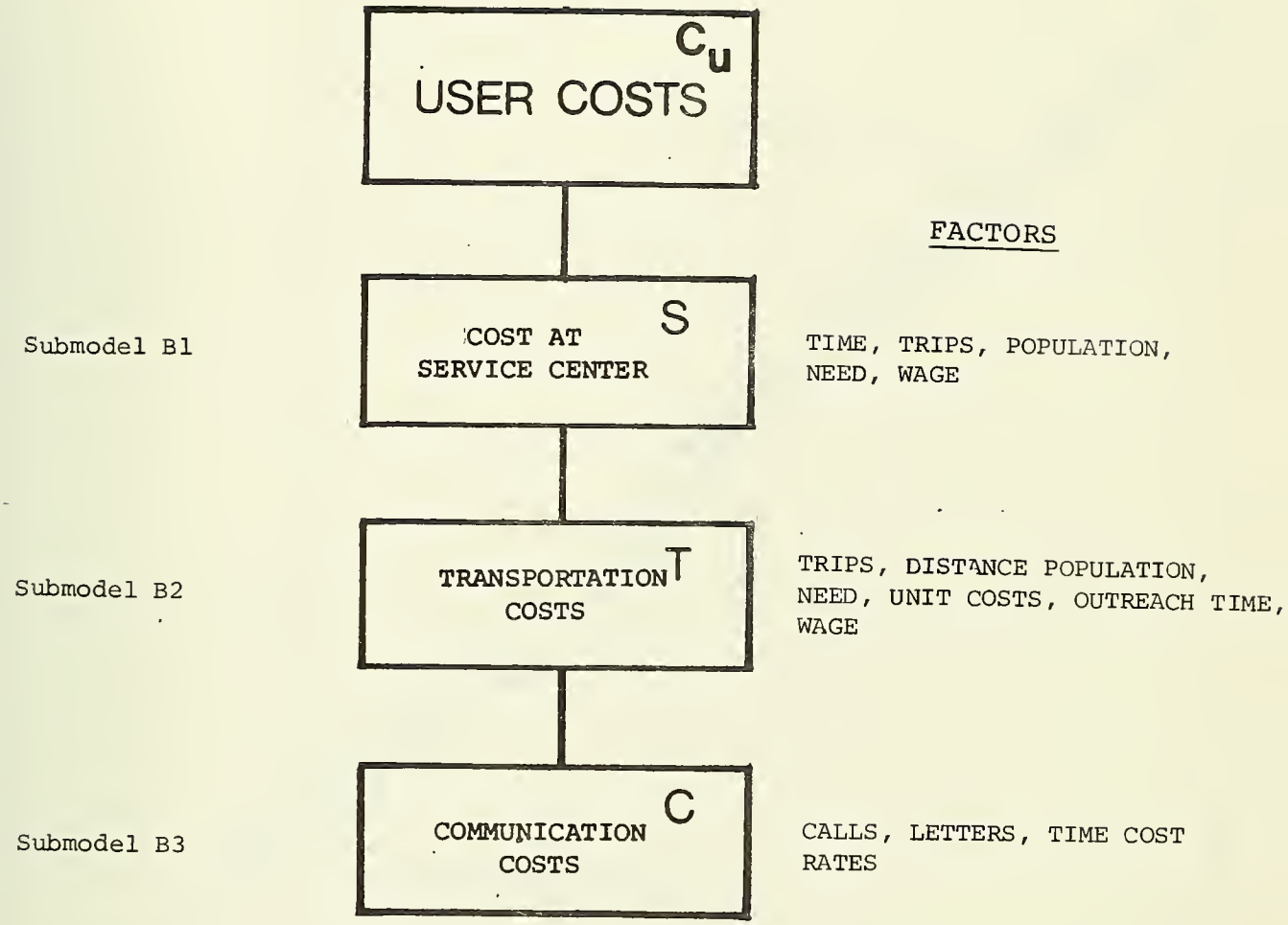


FIGURE 5.

USER COST MODEL

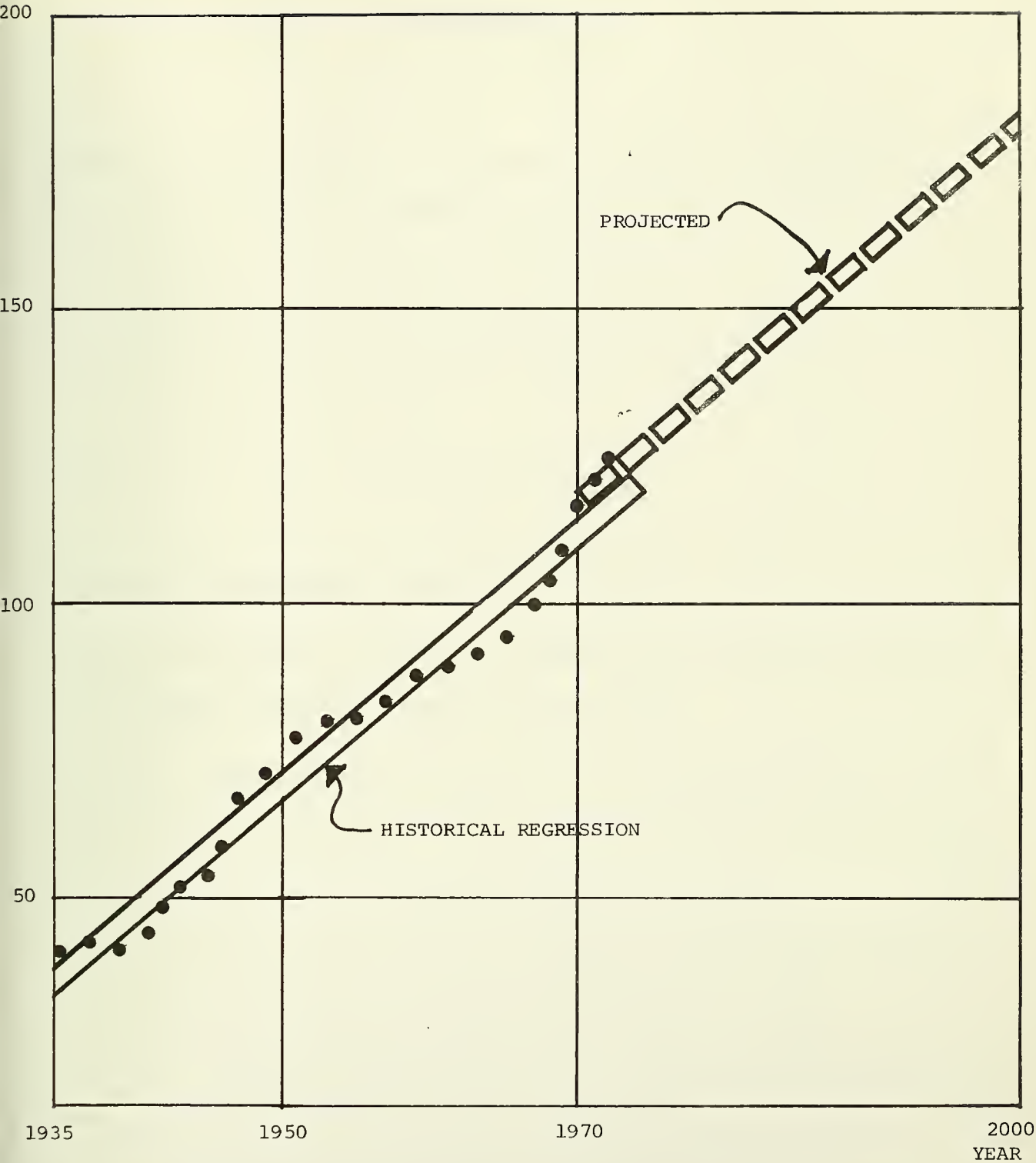


FIGURE 6

CONSUMER PRICE INDEX
TIME PROJECTION

STATE COST SUBMODELS

State costs were developed from the following submodels:

- Facilities Investment Costs (A1)
- Recurring Facilities Costs (A2)
- Equipment Investment Costs (A3)
- Recurring Equipment Costs (A4)
- Personnel Costs (A5)

Each submodel will be explained below.

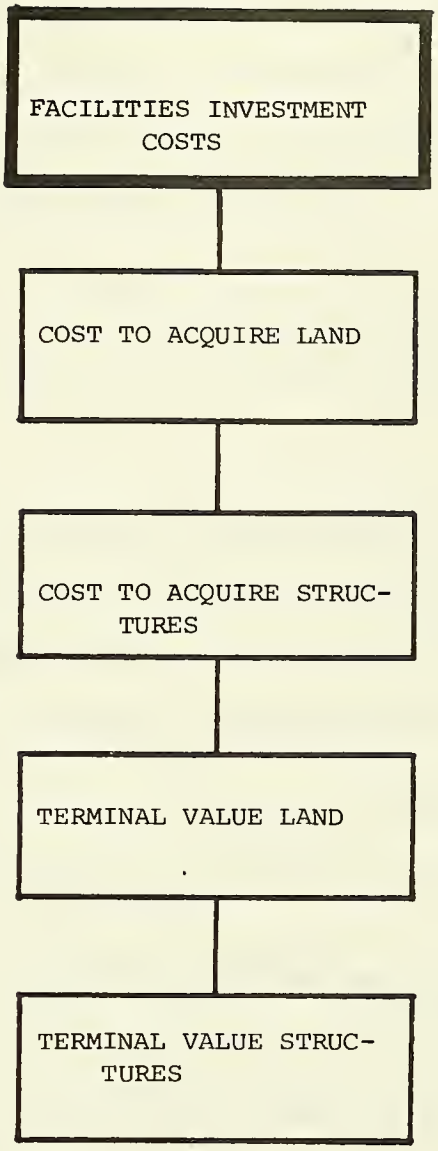
FACILITIES INVESTMENT COSTS (Submodel A1)

Both the facilities investment submodel and a schematic diagram of its major elements is shown in Figure 7.

The model evaluates the costs incurred by the state when it acquires its own land and office buildings for MSC related services.

Factors studied in the submodel analysis included:

- prevailing interest rates for land and building (F_L, F_B)
- square footage of state owned buildings (A_{BO})
- land and building construction costs (I_L, I_B)
- a regional building cost factor (G)
- value of state owned land and structures at the end of the amortization period (V_L, V_{BO})

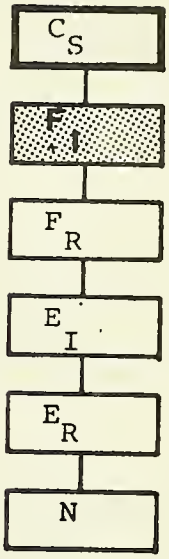


$$\frac{F_L \; I_L \; A_{BO}}{Y_F}$$

$$\frac{F_B \; (A_{BO} \; I_B \; G)}{Y_F}$$

$$\frac{V_L \; (I_L \; A_{BO})}{Y_F}$$

$$\frac{V_{BO} \; (I_B \; A_{BO} \; G)}{Y_F}$$



KEY: State Cost Model

$$F_I = \sum_{MSC}^{all} \frac{F_L \; I_L \; A_{BO} + F_B \; (A_{BO} \; I_B \; G) - V_L \; (I_L \; A_{BO}) - V_{BO} \; (I_B \; A_{BO} \; G)}{Y_F}$$

FIGURE 7

FACILITIES INVESTMENT COSTS

STATE COST SUBMODEL A1

In evaluating the existing system (Concept A) total state owned building area was taken from Appendix 300B, State Service Facility Inventory. Only facilities involved in service delivery were included in the analysis.

Only 8 percent of the 1,489,112 square feet of space now used by the State of Maryland for delivery of services is owned by the state.

Total Concept A building area was projected to the year 2000 according to an expected 60 percent growth in state population. It was felt that additional space requirements will grow in the same proportion as total state population.

Likewise, the ratio of owned to leased facilities in Concept A (2000) was assumed to be the same as the existing system (1970).

Assuming that state owned structures existing at any point in time are built in even increments over a 30 year period allows average unit acquisition cost to equal new construction costs in the middle of the period.

Use of 1955 unit costs for land and buildings allowed the evaluation of 1970 investment costs. Use of 1985 land and building costs allowed evaluation of year 2000 investment costs.

Although the average life of a public building before structural obsolescense is approximately 70 years, an amortization period of 35 years was considered appropriate. After 35 years, extensive and costly renovation almost equal to the structure's original cost would have to be undertaken.

Amortization costs for state facilities were expressed as an annual expense.

Interest rates of 4.75 percent per annum for 15 year state construction bonds (present state rates) were used in the submodel.

SUBMODEL RESULTS

The results of the facilities investment submodel for Concepts A and F in 1970 and the year 2000 are as follows:

CONCEPTS	1970	2000
A	$ 72,000	$ 289,000
F	$907,000	$4,300,000

In 1970 state investment costs are estimated to be over 11 times greater under Concept F than Concept A. In the year 2000 investment costs under the Multi-Service Center system are estimated to be 14 times larger than would occur under the existing system. This greater expense under Concept F is due

to ownership of most facilities under the Multi-Service system rather than leasing as is customary in the existing system.

Investment costs under Concept F are only 1.7 percent of total state system costs in the year 2000.

RECURRING FACILITIES COSTS (Submodel A2)

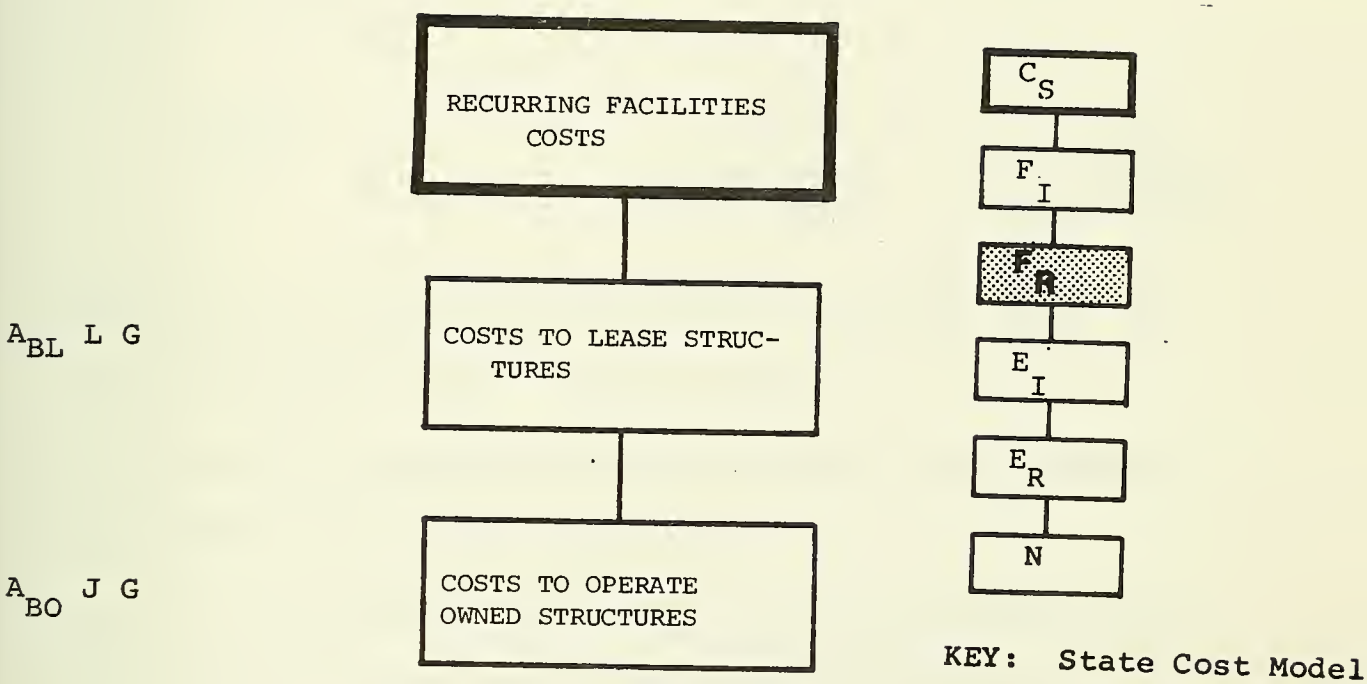
The recurring facilities costs submodel and a graphic representation are shown by Figure 8.

The submodel analyzes the cost to operate state owned structures or to lease facilities.

Variables included in the recurring facilities costs submodel are:

- building size (A_{BL})
- lease costs per square foot (L)
- maintenance cost per square foot for state owned structures (J)
- geographical cost adjustment factors (G)

Unit lease costs included all operating and utility expenses for rented buildings. These costs were developed from Appendix 300B, State Service Facility Inventory.



$$F_R = \sum_{SC}^{all} A_{BL} L G + A_{BO} J G$$

FIGURE 8

RECURRING FACILITIES COSTS

STATE COST SUBMODEL A2

An annual operating cost derived from Building Owners and Managers Association data was applied to cover security, utilities, janitorial, and maintenance expenses for state owned structures.

The research revealed no economies of scale in operating costs.

SUBMODEL RESULTS

Recurring facilities costs for Concepts A and F in 1970 and the year 2000 were:

CONCEPT	1970	2000
A	$5,106,000	$14,098,000
F	$3,131,000	$ 7,146,000

Concept F had recurring facility costs 39 percent lower and $1,975,000 cheaper than Concept A in 1970.

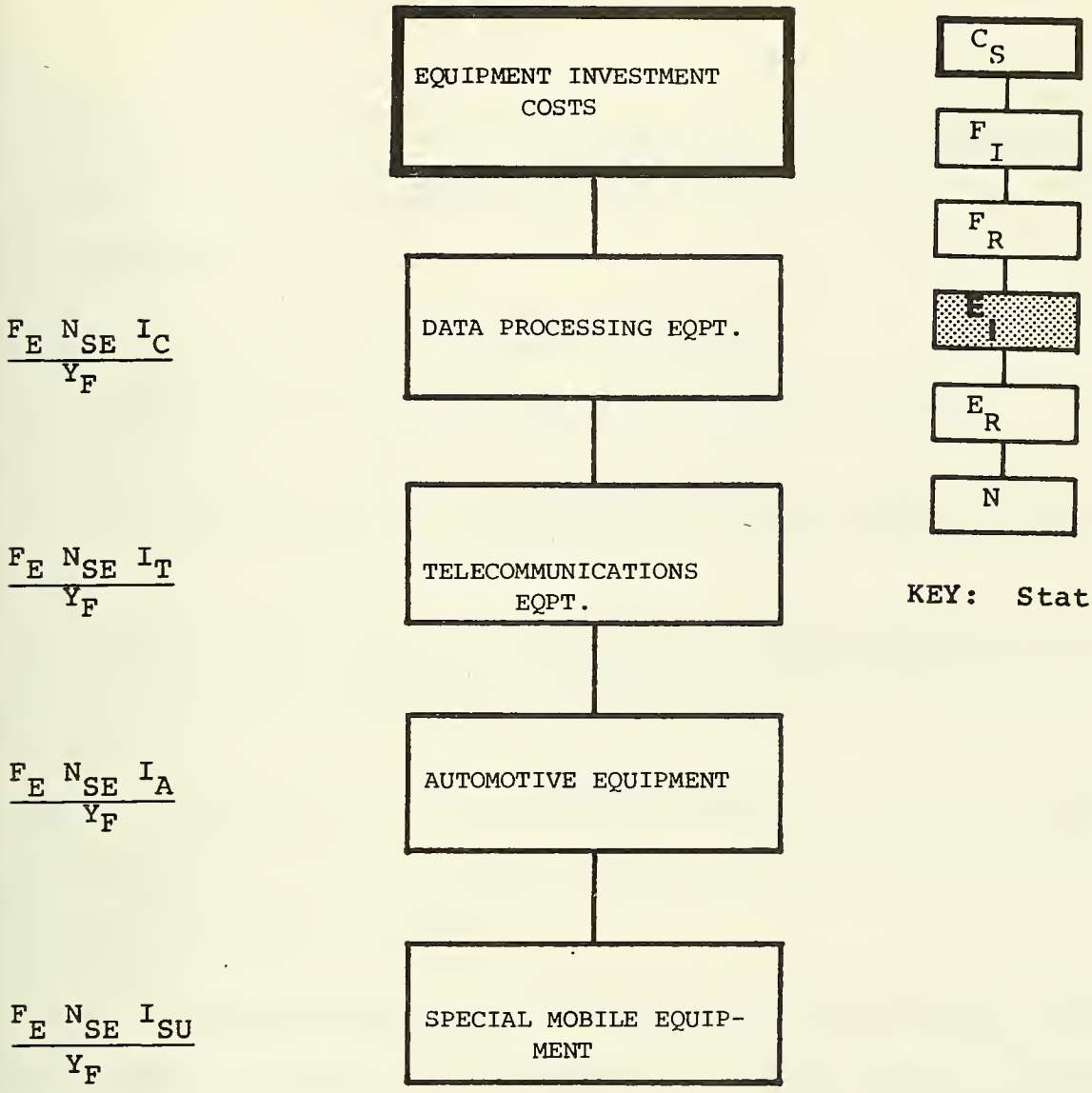
In the year 2000 Concept F will be 49 percent less expensive than Concept A and $6,952,000 cheaper.

Savings in recurring facility costs can be attributed to the reduced amount of facilities needed under Concept F.

EQUIPMENT INVESTMENT COSTS (Submodel A3)

The equipment investment cost submodel and a schematic explaination is represented by Figure 9.

This submodel estimates annual state expenditures to acquire capital equipment used in the provision of services.



$$E_I = \sum_{SC}^{all} \frac{F_E N_{SE} (I_C + I_T + I_A + I_{SU})}{Y_F}$$

FIGURE 9

EQUIPMENT INVESTMENT COSTS

STATE COST SUBMODEL A3

The model assumes a direct linear relationship between the number of service employees and the amount of money invested in equipment.

Variables used in this submodel include:

- the number of state service-delivery related employees (N_{SE})
- investment costs per employee for data processing, transportation, telecommunication, and special mobile unit equipment (I_C)
- a financial factor to account for the cost of borrowing funds to buy equipment (F_E) and to account for lost interest when operating funds are used to purchase equipment.

Because equipment life is generally short, a relatively high interest rate (discount rate) (6%) and a short amortization period (5 years) was used.

Since Maryland state data identifying each individual investment cost is unavailable, one factor, derived from the state departmental budgets, was used. It included budget line items for replacement and additional equipment. This amounted to $336 per employee in 1970 and is estimated to be $538 per employee in the year 2000.

Concept F proposes the use of mobile contact units to make service more accessible to persons unable to travel to service centers at fixed locations and to persons living in areas of the

state where travel to fixed centers may be costly and time-consuming. The mobile contact unit may be a specially equipped vehicle that takes specific services or information to the user bookmobile style, or it may simply be a bus or dial-a-ride system that takes users to the fixed centers. Costs for these units are included in this submodel as special mobile equipment costs.

It was assumed that special mobile equipment costs do not exist under Concept A, the existing system, but occur in the Multi-Service Center system. Special mobile equipment costs per employee were $648 for Concept F (1970) and $1,037 for Concept F (2000).

SUBMODEL RESULTS

The following were the equipment investment costs that occur under Concepts A and F in 1970 and the year 2000:

CONCEPT	1970	2000
A	$577,000	$1,478,000
F	$923,000	$2,061,000

Concept F would have been 60 percent more expensive than Concept A in 1970 and will be 39 percent more expensive in the year 2000. This is due to the increased investment in special mobile equipment under the Multi-Service Center system.

RECURRING EQUIPMENT COSTS (Submodel A4)

The recurring equipment costs submodel shown in Figure 10 computes the costs of operating and maintaining the equipment discussed in submodel A3.

Variables in the recurring equipment costs submodel include unit operating costs per employee for:

- data processing (D_C)
- telecommunications (D_T)
- transportation (D_A)
- special mobile contact unit equipment (D_{SU})

Costs for data processing equipment assume a 200 percent growth by the year 2000.

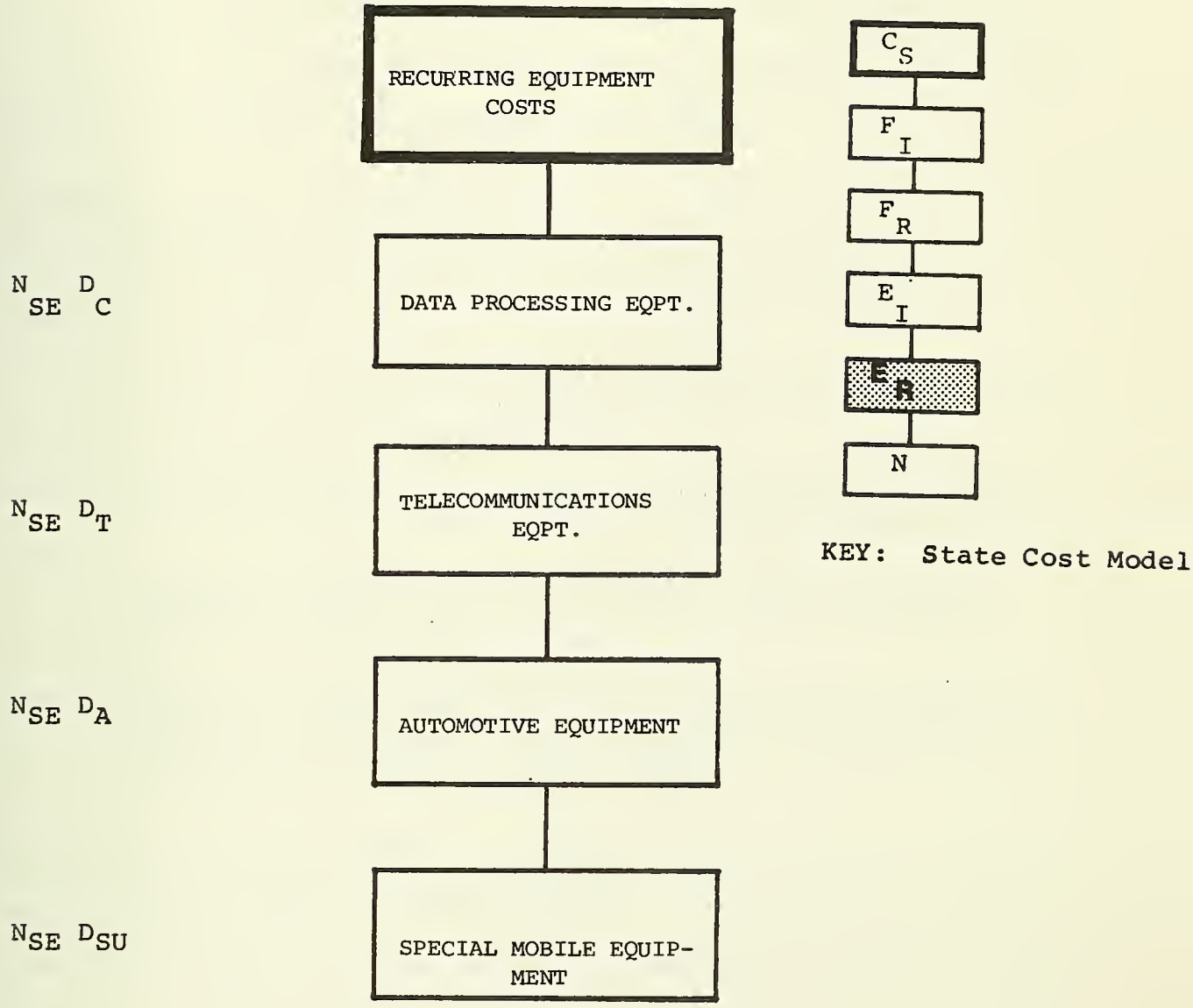
This figure includes a 60 percent inflation increase and 140 percent rise in expenses due to expansion and application of both existing and new technology.

It is assumed that both Concepts A and F make maximum use of data processing technology and incur equivalent costs per employee.

SUBMODEL RESULTS

Equipment operating and maintenance costs for the existing service delivery system and the Multi-Service system in 1970 and the year 2000 were:

CONCEPT	1970	2000
A	$3,446,000	$10,834,000
F	$2,678,000	$ 6,920,000



$$E_R = \sum_{SC}^{all} N_{SE} (D_C + D_T + D_A + D_{SU})$$

FIGURE 10

RECURRING EQUIPMENT COSTS

STATE COST SUBMODEL A4

The Multi-Service system's operating and maintenance costs are 22 percent lower than the existing service delivery system and will be 36 percent lower in the year 2000.

PERSONNEL COSTS (submodel A5)

The personnel costs submodel is represented by Figure 11.

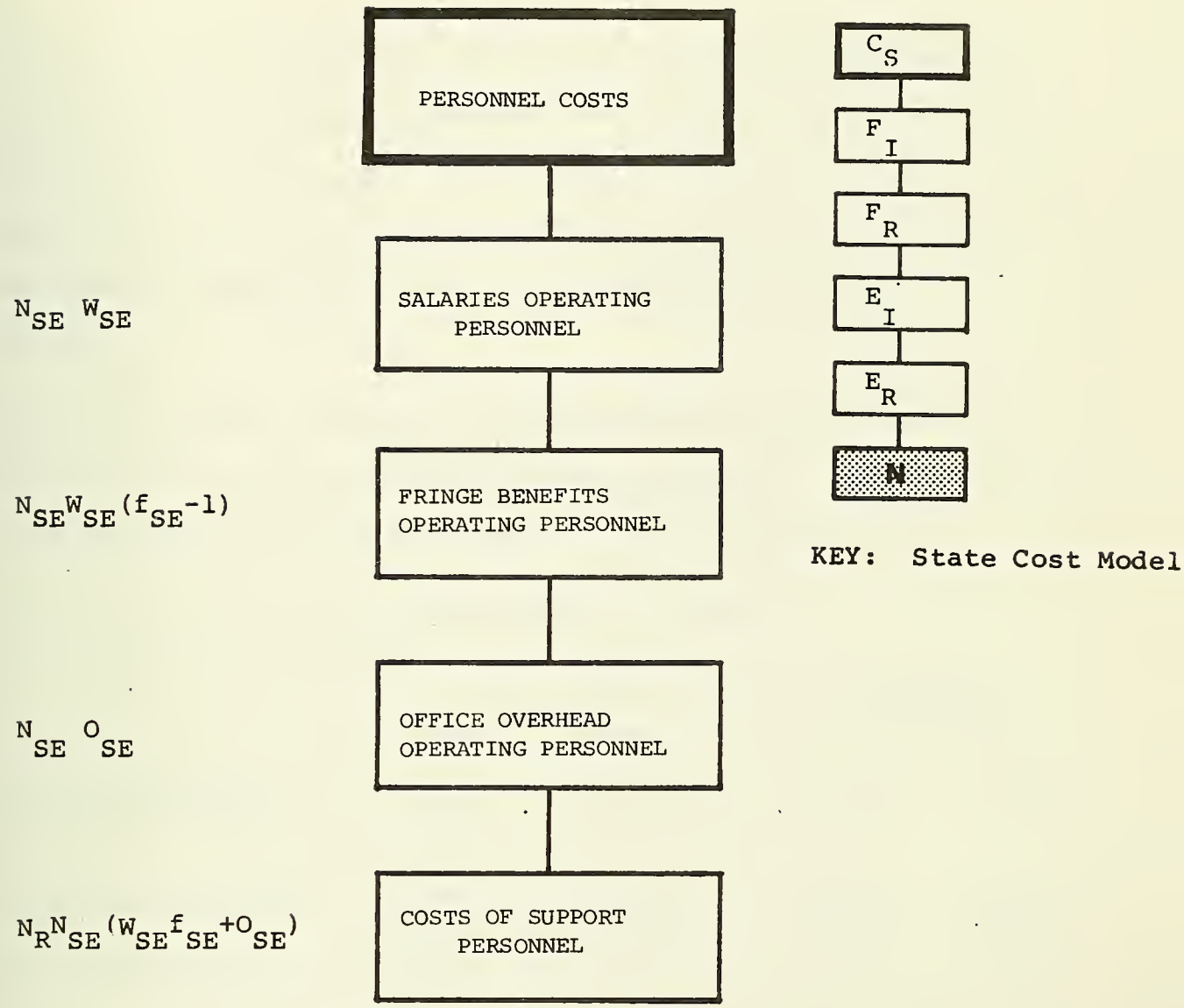
Variables used are:

- number of state service-delivery-related personnel (N_{SE})
- average employee salary (W_{SE})
- a fringe benefit factor applied to salaries to account for retirement, health plans, and other benefits (f_{SE})
- a direct overhead unit cost per employee which encompasses expenditures for travel, office equipment, supplies, and materials (O_{SE})
- ratio of support personnel to service delivery related personnel (N_R). This variable, multiplied by N_{SE}, estimates the number of support personnel required by a particular service delivery system.

The average annual salary of a state service delivery-related employee was $8,400 in 1970 according to computations based on the state budget. In the year 2000, the average salary is estimated to increase to $13,400.

Fringe benefits are estimated as 30 percent of base salary.

The annual cost for service-delivery-related supplies, materials, equipment, and other expenses was $2,406 per employee in 1970 according to the budget. They are estimated to be $3,850 per employee in the year 2000.



$$N = \sum_{SC}^{all} N_{SE} (W_{SE} f_{SE} + O_{SE}) + N_R N_{SE} (W_{SE} f_{SE} + O_{SE})$$

FIGURE 11

PERSONNEL COSTS

STATE COST SUBMODEL A5

Based on the Maryland state budget figures, there were approximately 7,400 service-delivery-related employees in 1970. This staff would increase to 11,840 persons in the year 2000 if the existing system (Concept A) continues. A support personnel to delivery personnel ratio of 1:1 is assumed for the existing system.

The Multi-Service Centers in Concept F will employ 5,640 service-delivery-related persons in the year 2000. Under Concept F the support to delivery personnel ratio will be 1.8:1.

Total personnel requirements are as follows:

	Concept A		Concept F	
	1970	2000	1970	2000
Service Delivery Related Personnel	7,400	11,840	4,045	5,640
Support Personnel	7,400	11,840	7,280	10,150
Total Personnel	14,800	23,680	11,325	15,790

The savings identified in Concept F result primarily from these reduced numbers of state employees required to support, manage and deliver services. Co-locating state agencies and integration of the program and administration approach to service delivery provides the opportunity to more efficiently utilize state personnel. Under the existing system, service delivery is performed from an estimated 448 locations scattered throughout the state,

as compared to a total of 34 delivery locations under Concept F, providing the service required to meet the year 2000 population needs.

Implicit in this centralized approach to the delivery of state services is a reduced requirement of both support and delivery personnel to perform the necessary reception, informational, general clerical, intake, outreach, and provision of needed services. Personnel cost savings opportunities are enhanced as a result of:

- More effective deployment and management of staff at fewer service delivery locations.
- Application of automated information and data banking functions to the intake and eligibility determination procedures associated with direct contact programs.
- Separation of administrative and service delivery activities, allowing increased caseload and service work delivery standards.
- Avoidance of program overlaps and duplications of effort.
- Centralization of all public assistance program intake functions.
- Integration of program intake procedures providing single application review and eligibility determinations in respect to the full range of applicable direct contact programs.
- Elimination of referral systems by virtue of program proximities.

SUBMODEL RESULTS

Personnel costs under the two alternative systems were:

CONCEPT	1970	2000
A	$197,225,000	$503,674,000
F	$150,930,000	$335,896,000

The Multi-Service Center system saves over $46,000,000 in personnel costs in 1970 when compared with the existing system and would save $167,778,000 in the year 2000.

STATE COSTS

The following table displays the results of operating the preceding submodels using the variables and assumptions discussed and indicates the percentage impact of each component on the submodel. Detailed calculations and variable tabulations are contained in Appendix 600A.

STATE COSTS*

C O N C E P T A

	Submodel	1970	%	2000	%
C_S	Total State Costs	$ 206,426,000	100	$ 530,373,000	100
F_I	Facilities Investment Costs	72,000	0.0	289,000	0.0
F_R	Recurring Facilities Costs	5,106,000	2.5	14,098,000	2.7
E_I	Equipment Investment Costs	577,000	0.3	1,478,000	0.3
E_R	Recurring Equipment Costs	3,446,000	1.7	10,834,000	2.0
N	Personnel Costs	197,225,000	95.5	503,674,000	95.0

C O N C E P T F

	Submodel	1970	%	2000	%
C_S	Total State Costs	$ 158,569,000	100	$ 356,323,000	100
F_I	Facilities Investment Costs	907,000	0.6	4,300,000	1.2
F_R	Recurring Facilities Costs	3,131,000	2.0	7,146,000	2.0
E_I	Equipment Investment Costs	923,000	0.6	2,061,000	0.6
E_R	Recurring Equipment Costs	2,678,000	1.7	6,920,000	1.9
N	Personnel Costs	150,930,000	95.1	335,896,000	94.3

*Values shown are based on 1970 and year 2000 (inflated) dollars. For a comparison in 1970 constant dollars, see appendix.

USER COST SUBMODELS

User costs were developed from three submodels:

- Cost at service center (B1)
- Transportation costs (B2)
- Communication costs (B3)

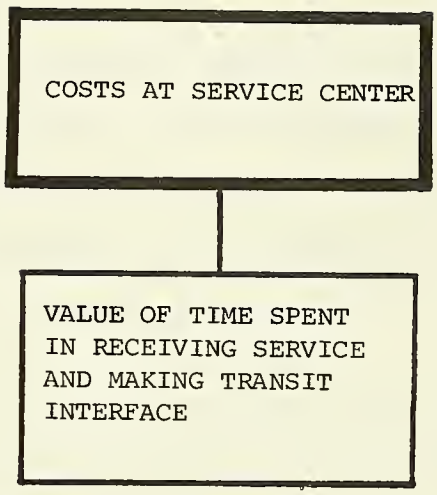
Each user cost submodel will be described in the same manner as state costs were.

COSTS AT SERVICE CENTER (Submodel B1)

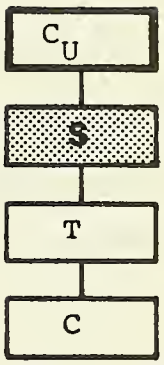
The cost at service center submodel is shown in Figure 12. It estimates the value of the time spent at state offices by all recipients of state social services. Variables are:

- average user time at service center (h)
- hourly wage factor (w)
- average number of trips to service centers (per citizen, per year), (t_i)
- service area populations (p_i)
- service area need factors (c_i)

User time at service center includes time spent for automobile parking, case worker interviews, and waiting for each trip made by a user to a state office. For Concept F, this time was estimated at 1/2 hour, based on interviews with case workers at the Department of Employment and Social Services and an assumption that one service need is fulfilled for every trip made by a user.



$$hw \sum_{n}^{i} t_i \, p_i \, c_i$$



KEY: User Cost Model

$$S = \sum_{SC}^{all} hw \sum_{n}^{i} t_i \, p_i \, c_i$$

FIGURE 12

COSTS AT SERVICE CENTER
USER COST SUBMODEL B1

In evaluating Concept F, the assumption was made that user time at the service center increases, because it is likely that more than one service need can be fulfilled per trip to a multi-service facility.

At the same time, the average number of trips to service centers was assumed to decline 25% under Concept F because of trip consolidation and reduced "searching", whereby a user may be referred to another building or even another city for proper servicing of his need under Concept A.

The wage factor was the legislated minimum wage in 1970 ($1.60 per hour), inflated by the consumer price index to the year 2000 ($2.72).

A need factor appears in all three user-cost submodels. It accounts for the existence of greater numbers of social service clients (users) in economically depressed communities and correspondingly fewer users in high income communities.

The need factor was developed for each service area in the state by comparing its median family income to the state as a whole. Need factor values range from 1.88 for Somerset County to 0.66 for Montgomery County.

SUBMODEL RESULTS

The following were the user expenses under the costs at service center submodel for Concepts A and F in 1970 and the year 2000.

CONCEPT	1970	2000
A	$3,387,000	$8,711,000
F	$2,880,000	$7,280,000

Concept F was approximately 15 percent less expensive than the existing system in both 1970 and 2000.

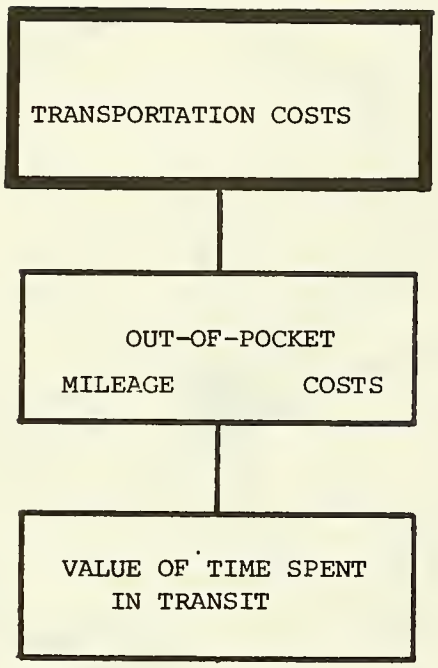
TRANSPORTATION COSTS (Submodel B2)

The transportation costs submodel is diagrammed in Figure 13. This submodel estimates the costs incurred by the user getting to the proper state office for receipt of services.

In addition to the factors discussed in the preceding submodel, the following variables affect user transportation costs:

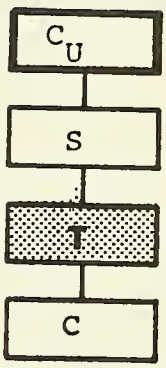
- distance from residence to service center (d_i)
- unit transportation cost (f_i)
- an expanded contact coefficient (m_i)
- unit time in transit (x_i)

The distance from user residence to service center was computed by map scaling total round trip travel distance from each election district within a service area to its service center (Figure 14).



$2t_i\ d_i\ p_i\ c_i\ f_i\ m_i$

$\sum_{n}^{i}\ 2t_i \times d_i\ p_i\ c_i\ m_i$



KEY: User Cost Model

$$T = \sum_{SC}^{all} \sum_{n}^{i} 2t_i\ d_i\ p_i\ c_i\ f_i\ m_i + w \sum_{n}^{i} 2t_i \times d_i\ p_i\ c_i\ m_i$$

FIGURE 13

TRANSPORTATION

USER COST SUBMODEL B2

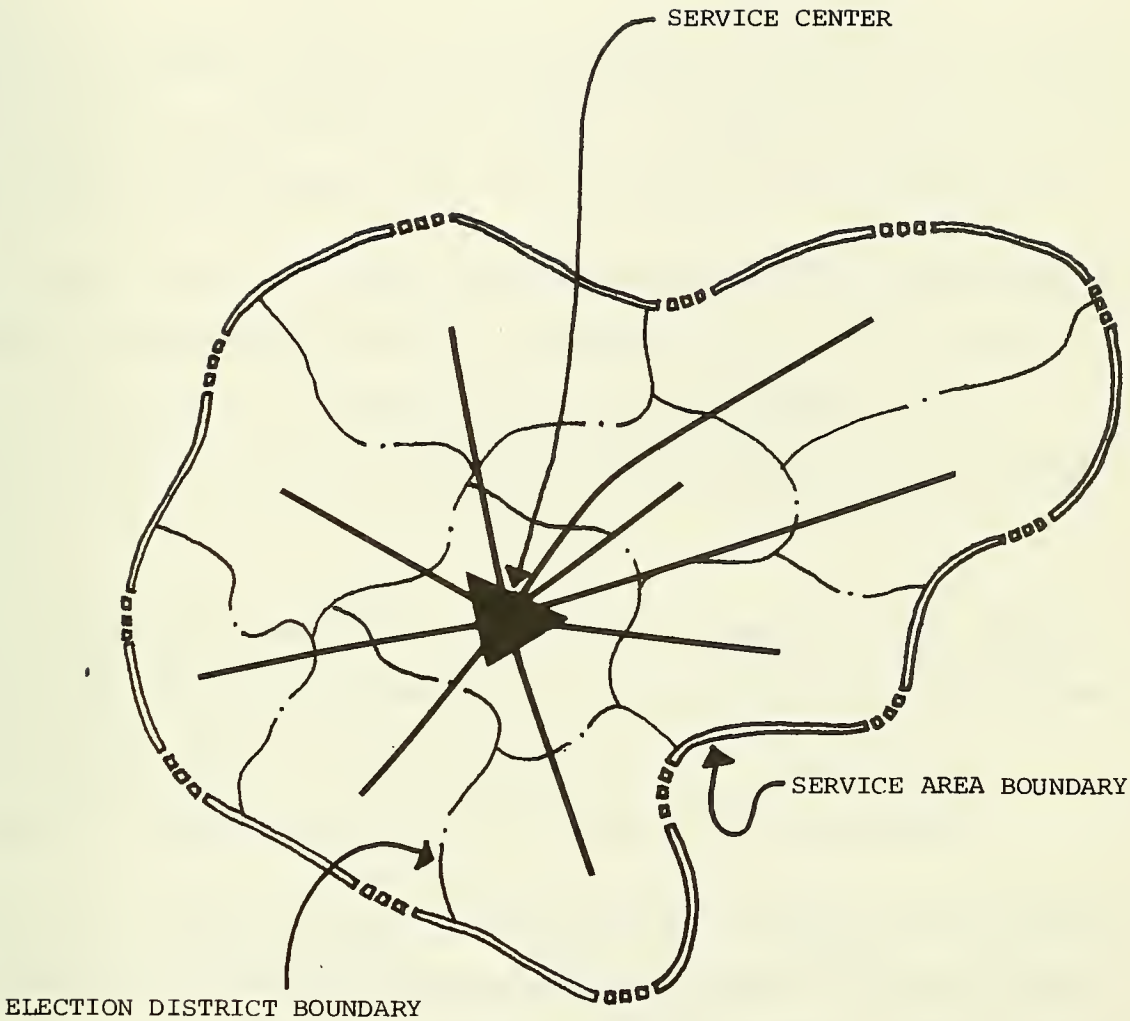


FIGURE 14

SCHEMATIC

USER TRAVEL DISTANCE

These linear distances were adjusted to account for the differences in urban, suburban, and rural road densities.

The unit transportation cost weights public and private modes of transit and is uniform for the state. It was $.119 per mile in 1970 and was estimated to be $.19 per mile in the year 2000.

The expanded contact coefficient accounts for the establishment of level one service centers and mobile client contact units under Concept F. It reduces the number of trips a user must make to a service facility and the distance for required trips.

The value of the coefficient was 1.0 for Concept A and ranges to 0.75 for the Lower Eastern Shore and Southern service areas of Concept F where, in each case, two rural intensity centers and a mobile unit network have been established.

The time in transit factor is assigned on a service area basis. It accounts for higher average highway speeds in rural areas and lower average highway speeds in urban areas. Urban, suburban, and rural speeds were 10, 24, and 45 miles per hour respectively.

SUBMODEL RESULTS

The following were the user transportation expenses for both concepts in 1970 and the year 2000.

CONCEPTS	1970	2000
A	$18,137,000	$45,877,000
F	$17,039,000	$24,171,000

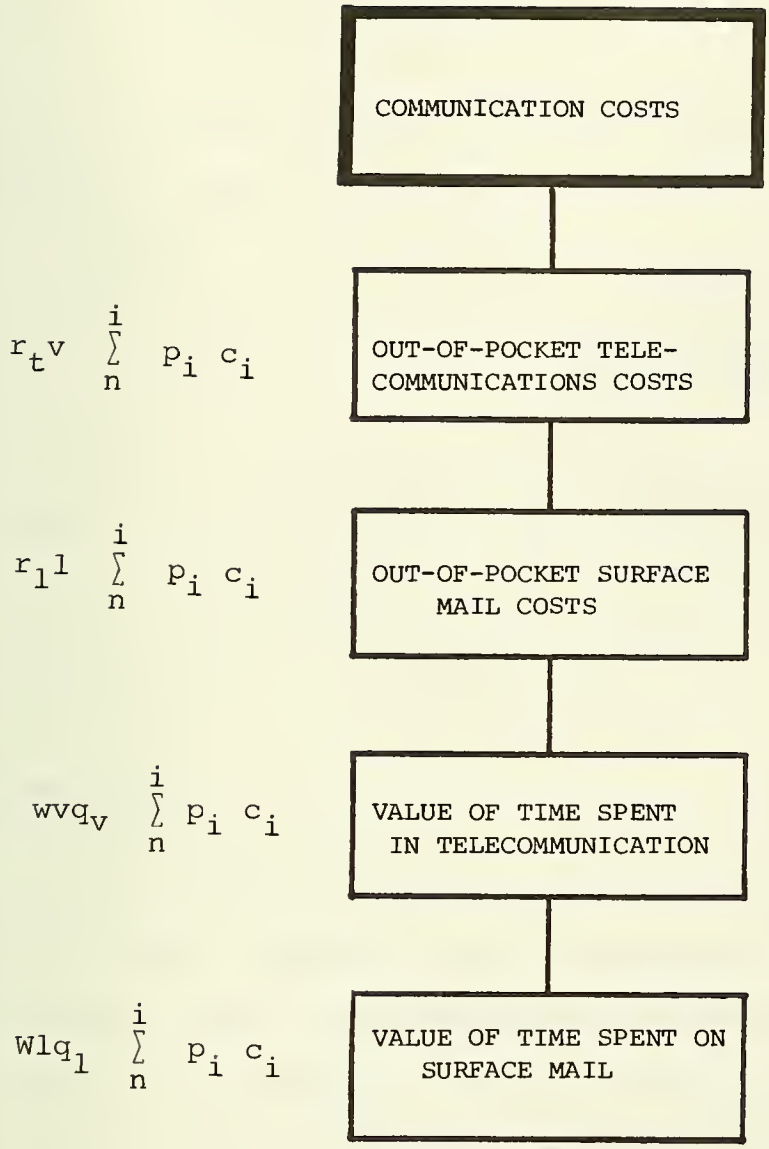
Transportation costs under Concept F were 6 percent lower than Concept A in 1970 and were 47 percent lower in the year 2000.

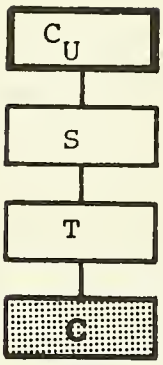
COMMUNICATION COSTS (submodel B3)

The communication costs submodel is shown in Figure 15. This submodel accounts for costs incurred by the user in contacting the state through means other than direct personal visits. Variables involved are:

- number of telephone calls (per citizen per year) (v)
- unit cost per call (r_t)
- number of letters (per citizen per year) (l)
- unit cost per letter (v_l)
- time spent in telephoning and letter writing (q_v, q_l)
- wage factor (w)
- service area populations (p_i)
- need factors (c_i)

The communication costs submodel assumes the number of calls and letters under Concept F will decrease by 25 percent.





KEY: User Cost Model

$$= \sum_{SC}^{all} (r_t v \sum_n^i p_i c_i) + (r_l l \sum_n^i p_i c_i) + (wvq_v \sum_n^i p_i c_i) + (wlq_l \sum_n^i p_i c_i)$$

FIGURE 15

COMMUNICATION COSTS

USER COST SUBMODEL B3

SUBMODEL RESULTS

The following were the user communication costs for each service delivery system:

CONCEPT	1970	2000
A	$16,300,000	$41,295,000
F	$11,773,000	$29,577,000

User communication costs under Concept F are 28 percent lower than under Concept A both in 1970 and the year 2000. In monetary terms, the savings amount to $4,527,000 in 1970 and $11,722,000 in the year 2000.

USER COSTS

The following table displays the results of operating the preceding user submodels using the variables and assumptions discussed. The table shows the percentage impact of each component on the submodel. Detailed calculations and variable tabulations are contained in Appendix 600A.

Table 3

USER COSTS*
($ per year)

C O N C E P T A

	Submodel	1970	%	2000	%
C_U	Total User Costs	$37,824,000	100.0	$95,883,000	100.0
S	Costs at Service Center	3,387,000	8.9	8,711,000	9.1
T	Transportation Costs	18,137,000	48.0	45,877,000	47.8
C	Communication Costs	16,300,000	43.1	41,295,000	43.1

C O N C E P T F

	Submodel	1970	%	2000	%
C_U	Total User Costs	$31,692,000	100.0	$61,028.000	100.0
S	Costs at Service Center	2,880,000	9.1	7,280,000	11.9
T	Transportation Costs	17,039,000	53.8	24,171,000	39.6
C	Communication Costs	11,773,000	37.1	29,577,000	48.5

*Values shown are based on 1970 and year 2000 (inflated) dollars. For a comparison in 1970 constant dollars, see appendix.

APPENDIX

MODEL VARIABLES

$$C_S = F_I + F_R + E_I + E_R + N$$

STATE COST MODEL

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
C_S	Total state costs	$/Year	See table 2 for results of submodel calculations				
F_I	Total investment cost for facilities	$/Year					
F_R	Total recurring facilities costs	$/Year					
E_I	Total investment costs for equipment	$/Year					
E_R	Total recurring equipment costs	$/Year					
N	Total personnel costs	$/Year					

STATE COST
SUBMODEL A1

$$F_I = \sum_{SC}^{all} \frac{F_L (I_L A_{BO}) + F_B (A_{BO} I_B G) - V_L (I_L A_{BO}) - V_B (I_B A_{BO} G)}{Y_F}$$

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
F_I	Total investment cost for facilities	$/Year					
I_L	Land cost bldg.	S/SF of	See table, I_L, I_B, Appendix 600 A				Use 1955 factor to generate 1970 costs; 1985 factor to generate year 2000 costs.
G	Geographical cost factor	Ratio	See table, Maryland State Labor Cost Index, Appendix 600 A				
F_L	Finance cost factor for land	Ratio	1.40	1.40	1.40	1.40	Assume interest rate = 4.75%, term = 15 years
			See table, Finance Cost Factor, Appendix 600 A				
A_{BO}	Building size, state owned	square feet	113,294	181,270	1,200,000	1,680,000	Gruen provided basic data 2000 exist. inflated by state population
I_B	Building construction cost including parking facilities	$/SF	See table, I_L, I_B, Appendix 600 A				Use 1955 factor to generate 1970 costs; 1985 factor to generate year 2000 costs.
F_B	Finance cost factor building	Ratio	1.40	1.40	1.40	1.40	Assume interest rate = 4.75%, term = 15 years
			See table, Finance Cost Factor, Appendix 600 A				
V_{BO}	Value of state-owned structure at end of amortization period	Ratio	.10	.10	.10	.10	Structure has some value, although it has been fully amortized. Assumption is that structure is continually deteriorating.

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
V_L	Value of state-owned land at end of amortization period	Ratio	1.8	1.8	1.8	1.8	Assume the value of land rises with the CPI aggregate.
Y_F	Amortization period for facilities investment	Years	35	35	35	35	Based on useful life of structure, assuming structural obsolesence or complete deterioration occurs in 70 years and one major renovation equal to acquisition cost occurs during the 70 year period.

$$F_R = \sum_{SC}^{all} A_{BL} L G + A_{BO} J G$$

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
F_R	Total recurring facilities costs	$/Year					
A_{BL}	Building size, leased	SF	1,375,817	2,201,307	13,500	12,000	State Facilities Inventory data, inflated by state population factor
L	Annual lease cost	$/SF/Year	See table, 600 A	Lease Cost,	Gov't Buildings,	Appendix	From State Facilities Inventory, Gruen. Inflated by Public Bldgs. Index (1.8)
J	Annual operation costs	$/SF/Year	2.61	4.18	2.61	4.18	J comprises factors of security, utilities, and maintenance. Inflated by CPI aggregate Source: BOMA

$$E_I = \sum_{SC}^{all} \frac{F_E N_{SE} (I_C + I_T + I_A + I_{SU})}{Y_E}$$

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
E_I	Total investment cost for equipment	$/Year					
F_E	Finance cost factor for equipment	Ratio	1.16	1.16	1.16	1.16	6% @ 5 years
			See table, Finance Cost Factor, Appendix 600 A				
N_{SE}	Number of state service delivery-related employee	Employees	7,400	11,840	4,045	5,640	Reduced from state budget Inflated by state population. MSC data from Gruen Assoc.
I_C	Investment cost for data processing equipment per state service delivery related employee	$/employee					
I_T	Investment cost for telecommunications equipment per state-delivery-related employee	$/employee	336	538	336	538	Value represents sum of $I_C + I_T + I$. Reduced from state budget. Inflated by CPI aggregate.
I_A	Investment cost for automotive equipment per state service-delivery-related employee	$/employee					

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
I_{SU}	Investment cost for special mobile contact units per state service-delivery-related employee	$/employee	0	0	648	1,037	See Assumptions, Special Mobile Equipment. Year 2000 value inflated by CPI aggregate.
Y_E	Equipment Life	Years	5	5	5	5	

$$N = \sum_{SC}^{all} N_{SE} (W_{SE} f_{SE} + O_{SE}) + N_R N_{SE} (W_{SE} f_{SE} + O_{SE})$$

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
N	Total personnel costs	$/Year					
W_{SE}	Average annual salary of state delivery related employee	$/Year	8,400	13,400	8,400	13,400	Reduced from state budget. Inflated by CPI aggregate
f_{SE}	Fringe benefit factor to account for vacations, sick leave, pensions, etc.	Ratio	1.3	1.3	1.3	1.3	
O_{SE}	Annual cost per state service delivery related supplies, materials, equipment, and expenses.	$/employee/	2,406	3,850	2,406	3,850	Reduced from state budget. Inflated by CPI aggregate.
N_R	Ratio of support personnel to service delivery related personnel.	Ratio	1	1	1.8	1.8	

YEAR 1970 MULTI-SERVICE CENTER STAFF & BUILDING SIZE

AREA	LEVEL 1 SATELLITE	LEVEL 2 THRESHOLD	LEVEL 3 SURURBAN	LEVEL 4 URBAN	
Baltimore City			2	1	
Baltimore County			3		
Prince George's		2		1	
Montgomery		1	2		
Washington		1			
Anne Arundel		3			
Carroll		1			
Howard		1			
Calvert	1				
Charles		1			
St. Mary's	1				
Allegany		1			
Garrett	1				
Caroline	1				
Dorchester		1			
Talbot	1				
Cecil	1				
Kent		1			
Queen Anne's	1				
Somerset	1				
Wicomico		1			
Worcester	1				
Harford		1			
Frederick	—	1	—	—	
TOTALS	9	16	7	2	
Employees/MSC	5	100	200	500	
Size, SF/MSC	1,500	30,000	60,000	150,000	
Total Employees	45	1,600	1,400	1,000	= 4,045
Total Size, SF	13,500	480,000	420,000	300,000	= 1,213,500

YEAR 2000 MULTI-SERVICE CENTER STAFF & BUILDING SIZE

AREA	LEVEL 1 SATELLITE	LEVEL 2 THRESHOLD	LEVEL 3 SUBURBAN	LEVEL 4 URBAN
Baltimore City			2	1
Baltimore County			2	1
Prince George's			2	1
Montgomery		1	4	
Washington		1		
Anne Arundel		1	3	
Carroll		1		
Howard		3		
Calvert	1			
Charles		1		
St. Mary's		1		
Allegany		1		
Garrett	1			
Caroline	1			
Dorchester		1		
Talbot	1			
Cecil	1			
Kent		1		
Queen Anne's	1			
Somerset	1			
Wicomico		1		
Worcester	1			
Harford		2		
Frederick		1		
TOTALS	8	15	13	3
Employees/MSC	5	100	200	500
Size, SF/MSC	1,500	30,000	60,000	150,000
Total Employees	40	1,500	2,600	1,500 = 5,640
Total Size, SF	12,000	450,000	780,000	450,000 = 1,692,000

$C_U = S + T + C$

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
C_U	Total user costs	$/Year	See table 3 for results of submodel calculations				
S	Total user costs at service facility	$/Year					
T	Total user transportation costs	$/Year					
C	Total user communication costs	$/Year					

$$S = \sum_{SC}^{all} hw \sum_{n}^{i} t_i p_i c_i$$

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
S	Total user costs at service facility	$/Year					User time is assumed to increase from 30 minutes under Concept A to 35 minutes under Concept F
h	User Time at service	hours/ person	0.5	0.5	0.58	0.58	$t_i + v + 1$ is reduced 25 percent under Concept F.
t_i	Trips per user per year	# of trip per person per year	1.0	1.0	0.75	0.75	
p_i	Subcenter population	# people	See table, Variable Computations, Appendix 600 A				Election districts populations were used.
w	Value of user's time	$/hour	1.60	2.72	1.60	2.72	Minimum wage rate 1970 projected by CPI to 2000.
C_i	Need factor	Ratio	See table, Regionally Discriminate Variables, Appendix 600 A				C_i is based on ratio of median family income of service area to median family income of state.
n	Number of population subcenters within a service area	Election district	See table, Regionally Discriminate Variables, Appendix 600 A				

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
SC	Service Center	each	25	25	See table, Multi-Service Centers, Staff & Building Size		Existing system service centers are located at the county seat

$$T = \sum_{SC}^{all} \sum_{n}^{i} 2t_i\, d_i\, p_i\, c_i\, f_i\, m_i + w \sum_{n}^{i} 2t_i\, x_i\, d_i\, p_i\, c_i\, m_i$$

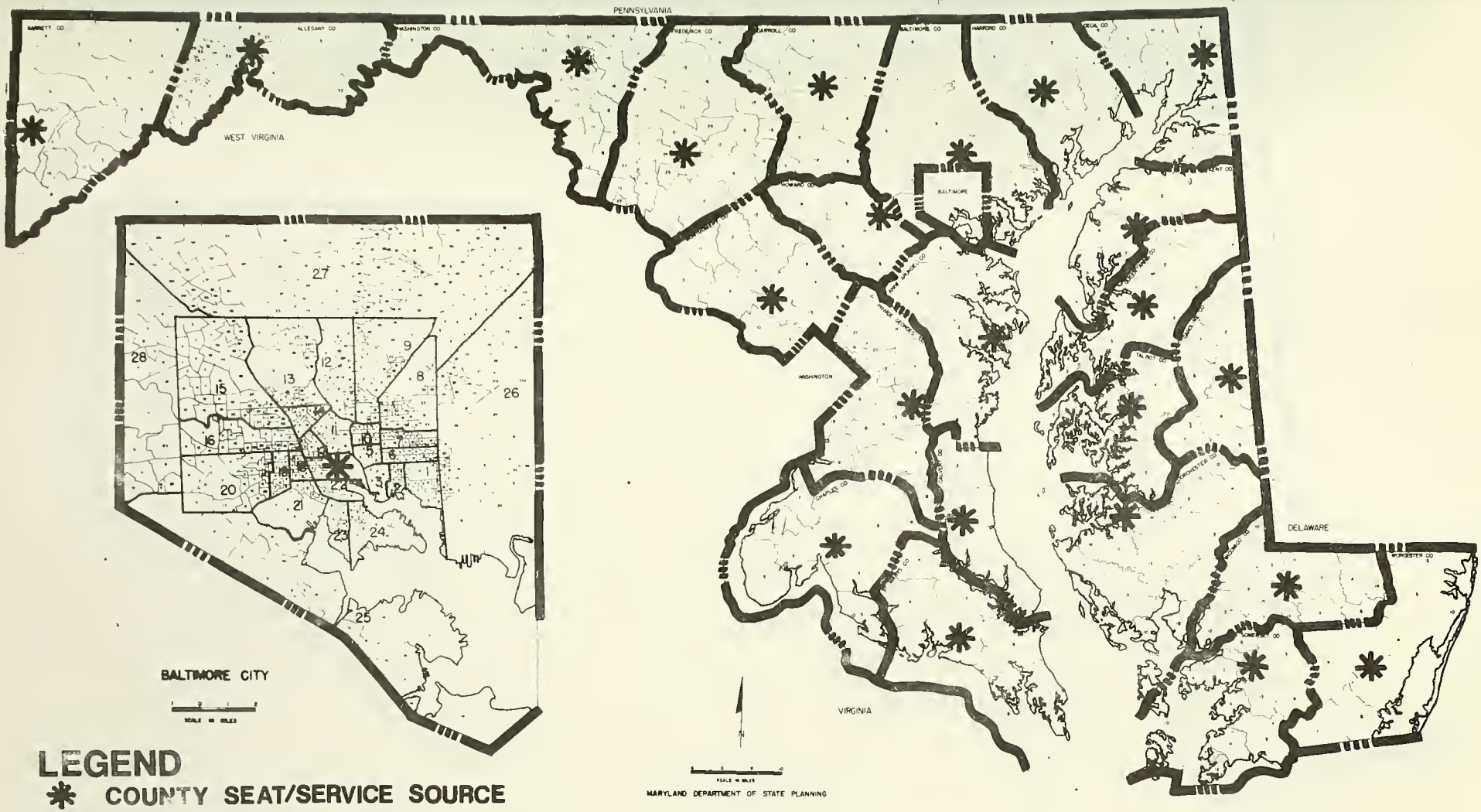
SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
T	Total user transportation costs	$/Year					
d_i	Distance from p_i to service center	Miles per one-way trip	See tables, Variable Computations, Appendix 600 A				Assume all services at a regional center or county seat for existing system. Each distance measured on straight line from election district to service center. Then apply a terrain factor to account for greater mileage where highway density is low.
f_i	Transportation cost	$/mile	0.119	0.19	0.119	0.19	Inflated by CPI transportation. Includes private & public transit modes.
m_i	Expanded contact coefficient	Ratio	See tables, Regional Discriminate Variables, Appendix 600 A				This factor accounts for varying degrees of user access to special mobile contact units provided by service centers.
x_i	Time spent in transit	hours/mile		.09 urban (10 mph) .04 suburban (24 mph) .02 rural (45 mph)			x_i varies by region according to local transportation network.

$$C = \sum_{SC}^{all} [r_t \, v \sum_{n}^{i} p_i \, c_i] + [r_l \sum_{n}^{i} p_i \, c_i] + [wvq_v \sum_{n}^{i} p_i \, c_i] + [wlq_l \sum_{n}^{i} p_i \, c_i]$$

SYMBOL	DEFINITION	UNIT	VALUE, CONCEPT A 1970	VALUE, CONCEPT A 2000	VALUE, CONCEPT F 1970	VALUE, CONCEPT F 2000	ASSUMPTIONS
C	Total user communication costs	$/Year					
r_t	Telecommunication cost rate	$/Call	.10	.16	.10	.16	All systems use telephone service. 1970 cost inflated by CPI aggregate.
v	Number of calls	calls/person/year	3.0	3.0	2.25	2.25	
r_l	Cost rate for surface	$/Letter	.06	0.10	.06	0.10	1970 value inflated by CPI aggregate.
l	Number of letters	Letters/person/user	5.0	5.0	3.75	3.75	
q_v	User time per call	Hours/call	0.12	0.12	0.12	0.12	Assume 7 minutes per phone call
q_i	User time per letter	Hour/Letter	0.33	0.33	0.33	0.33	20 minutes per letter

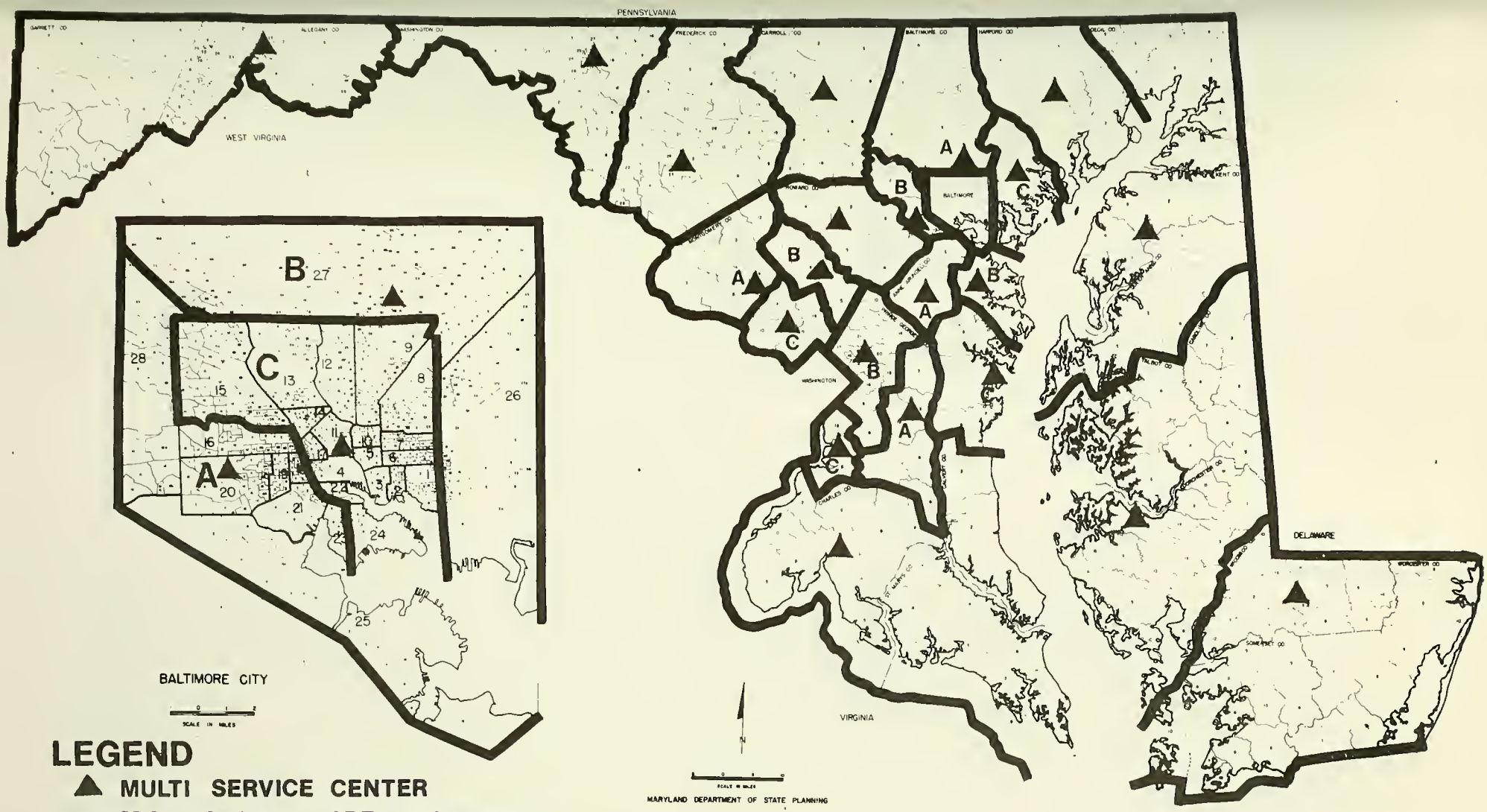
SERVICE AREAS

CONCEPTS A AND F (1970, 2000)



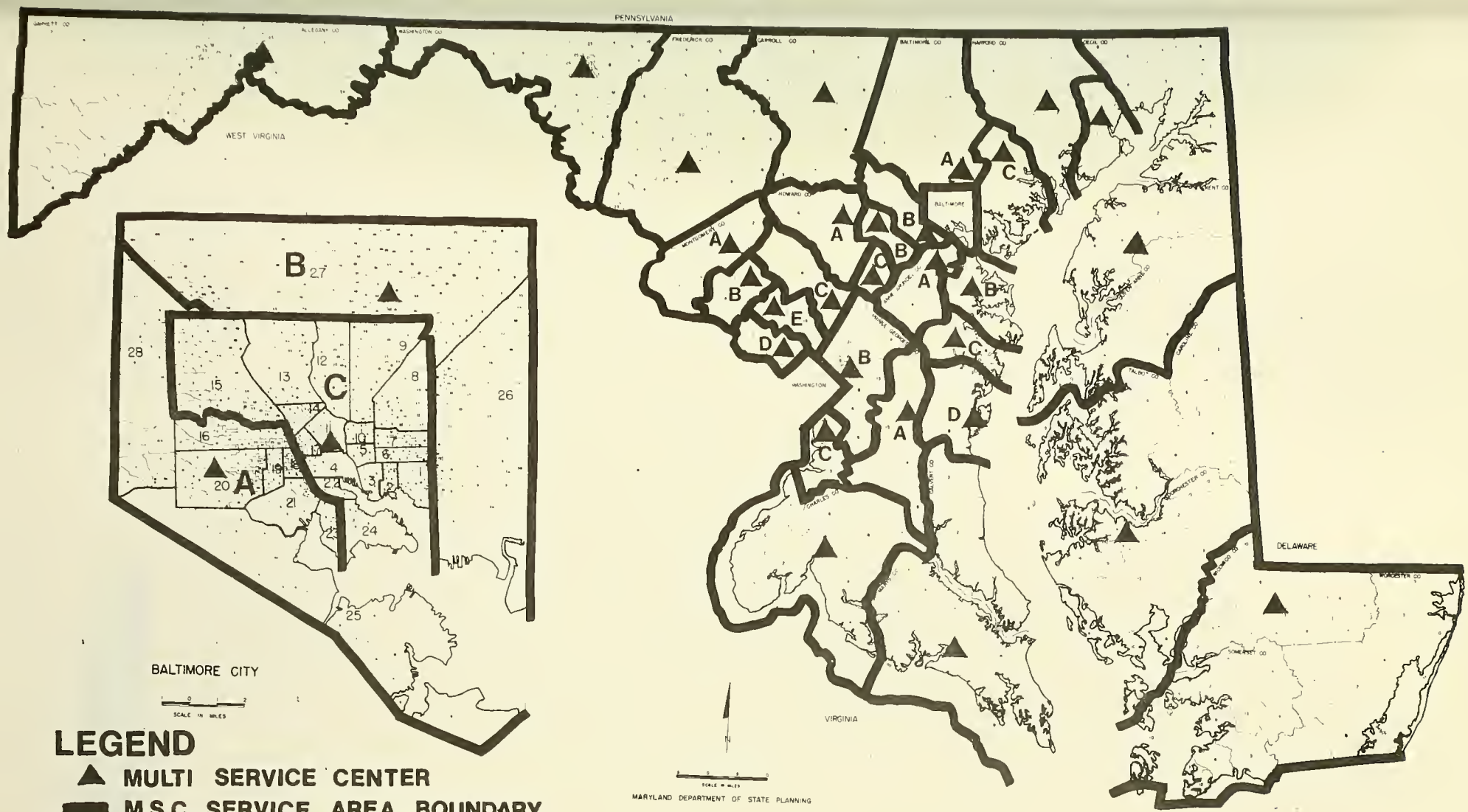
CONCEPT A (1970-2000)

SERVICE AREAS BY ELECTION DISTRICT



CONCEPT F (1970)

SERVICE AREAS BY ELECTION DISTRICT



CONCEPT F (2000)

SERVICE AREAS BY ELECTION DISTRICT

CONSTANT DOLLARS
COST SUMMARY

CONSTANT DOLLARS
COST SUMMARY

CONCEPT SYSTEMS COSTS SUMMARY*
($ per year)

CONCEPT A	1970	2000
Total Cost	$ 244,250,000	$ 368,386,000
State Costs	206,426,000	311,984,000
User Costs	37,824,000	56,402,000

CONCEPT F	1970	2000
Total Cost	$ 190,261,000	$ 245,501,000
State Costs	158,569,000	209,602,000
User Costs	31,692,000	35,899,000

*Constant 1970 dollars

STATE COSTS*
($ per year)

C O N C E P T A

	Submodel	1970	%	2000	%
C_S	Total State Costs	$206,426,000	100.0	$311,984,000	100.0
F_I	Facilities Investment Costs	72,000	0.0	170,000	0.0
F_R	Recurring Facilities Costs	5,106,000	2.5	8,293,000	2.7
E_I	Equipment Investment Costs	577,000	0.3	869,000	0.3
E_R	Recurring Equipment Costs	3,446,000	1.7	6,373,000	2.0
N	Personnel Costs	197,225,000	95.5	296,279,000	95.0

C O N C E P T F

	Submodel	1970	%	2000	%
C_S	Total State Costs	$158,569,000	100.0	$209,602,000	100.0
F_I	Facilities Investment Costs	907,000	0.6	2,529,000	1.2
F_R	Recurring Facilities Costs	3,131,000	2.0	4,204,000	2.0
E_I	Equipment Investment Costs	923,000	0.6	1,212,000	0.6
E_R	Recurring Equipment Costs	2,678,000	1.7	4,071,000	1.9
N	Personnel Costs	150,930,000	95.1	197,586,000	94.3

*Constant 1970 dollars

USER COSTS*
($ per year)

C O N C E P T A

	Submodel	1970	%	2000	%
C_U	Total User Costs	$37,824,000	100.0	$56,402,000	100.0
S	Costs At Service Center	3,387,000	8.9	5,124,000	9.1
T	Transportation Costs	18,137,000	48.0	26,987,000	47.8
C	Communication Costs	16,300,000	43.1	24,291,000	43.1

C O N C E P T F

	Submodel	1970	%	2000	%
C_U	Total User Costs	$31,692,000	100.0	$35,898,000	100.0
S	Cost At Service Center	2,880,000	9.1	4,282,000	11.9
T	Transportation Costs	17,039,000	53.8	14,218,000	39.6
C	Communication Costs	11,773,000	37.1	17,398,000	48.5

*Constant 1970 dollars

COMMENT REPLY FORM
PHASE 600 REPORT

Date: _____

1. METHODOLOGY

   Comments:

2. CONCEPT SYSTEM COSTS

   Comments:

3. MSC DESIGN IMPLICATIONS

   Comments:

4. STATE COST SUBMODEL

   Comments:

5. USER COST SUBMODEL

   Comments:

6. GENERAL COMMENTS AND RECOMMENDATIONS

COMMENT REPLY FORM
PHASE 600 REPORT

Prepared By:

Department:

Date:

This copy to be returned to:

Department of State Planning

Attention: Melvin Ginsburg,
Project Director

1. METHODOLOGY

   Comments

2. CONCEPT SYSTEM COSTS

   Comments:

3. MSC DESIGN IMPLICATIONS

   Comments:

4. STATE COST SUBMODEL

   Comments:

5. USER COST SUBMODEL

   Comments:

6. GENERAL COMMENTS AND RECOMMENDATIONS

ABSTRACT

Title:	State of Maryland Multi-Service Center Study Phase 600 - Analysis of Costs and Benefits
Author:	Urban Pathfinders, Inc. subconsultant to Gruen Associates, Inc.
Subject:	Comparative analysis of costs and benefits of alternative system concepts for the delivery of government services to State of Maryland residents.
Date:	February, 1974
Planning Agency:	Maryland Department of State Planning
Source of Copies:	Maryland Department of State Planning State Office Building 301 W. Preston Street Baltimore, Maryland 21201 Cost: No charge (Quantities limited) Reference copies available on request
HUD Project Number:	MD P-1008
Number of Pages:	79
Series Number:	221
Abstract:	The Analysis of Costs and Benefits is prepared as part of the "Phase 600 - Maryland Multi-Service Center Study". The report provides an economic basis for comparing two selected alternative government services. The analysis evaluates the costs and benefits of each alternative system from both the state and user point of view. The two service delivery systems evaluated in the report consist of: (1) Concept A (The Existing System) characterized by 448 scattered office facilities within service areas defined generally by political boundaries, and (2) Concept F (Multi-Service Center System) characterized by 34 centralized state office facilities within service areas delineated by population support levels. The analysis

evaluates the economic advantages and disadvantages of both systems at two points in time, 1970 and 2000.

The report contains an explanation of study methodology, the analytical model utilized in the evaluation and all study findings. Basic conclusions are drawn from the resulting cost/benefit comparisons, and elements of the Multi-Service Center system alternative are examined as a means of improving its design in subsequent study phases.

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